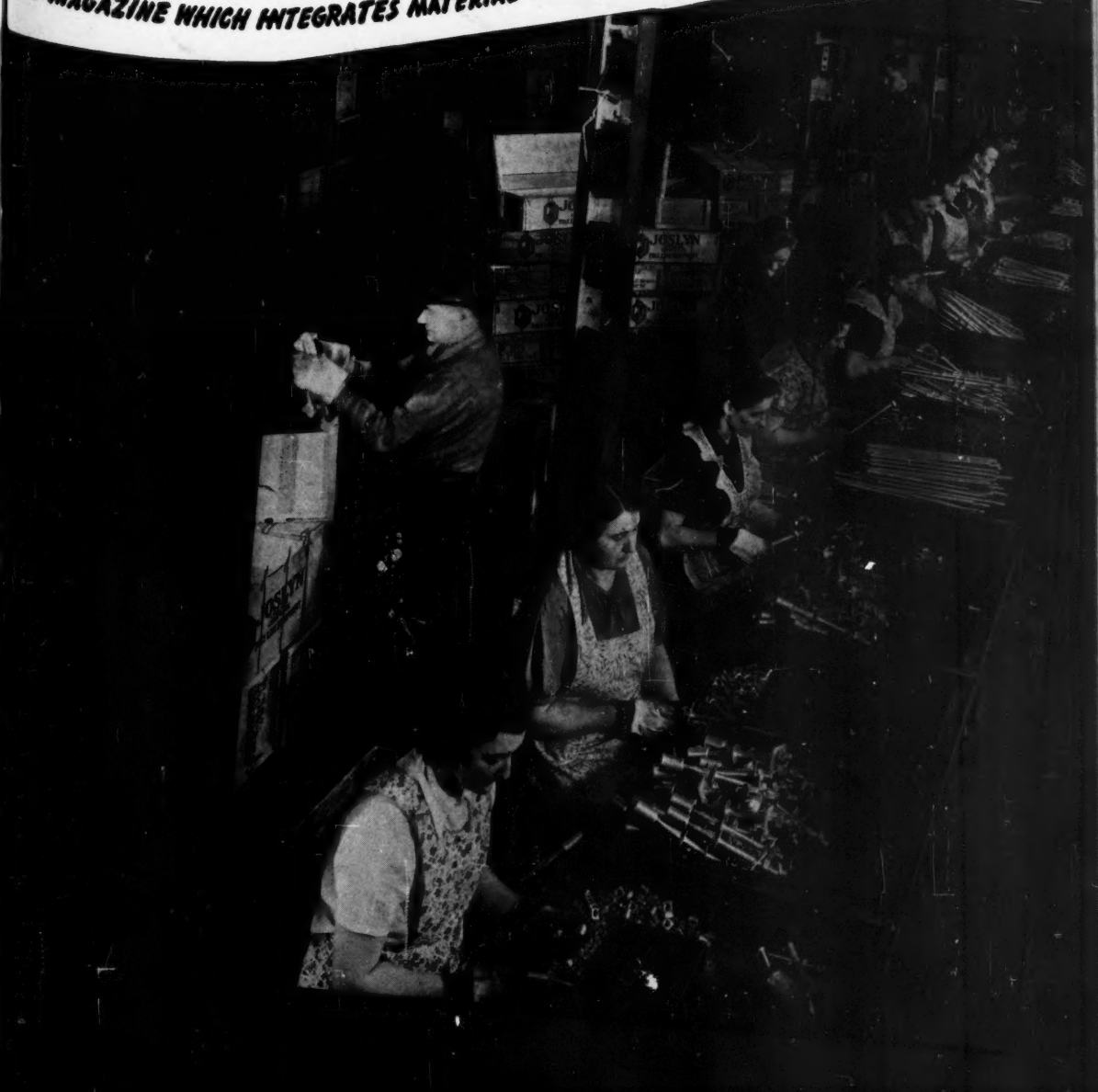
Modern

THE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTI



THIS ISSUE: Safety Glass Production...The Right Angle...Calling All Truck
Solving Unit Load Problems...Tools for Incentives...A Fine Lin

THERE'S A PROPER PLACE FOR *Huskies*

That place is the fringe of the Arctic Circle—where sledges drawn by "huskies" form the main freight lines of Canada's frozen northlands. For hauling and lifting operations around industrial plants the proper "huskie" is the Truck-Man.

Gasoline power and a hydraulic lift take all the burden of carrying and lifting—of skidded loads up to 2000 pounds. Compactness to snake around machines and along narrow aisles, with a second speed for brisk travel on the straightaways.

If the saving of time means anything in your business, Truck-Man deserves your consideration.

Ask for Descriptive Bulletin

Limited Open Territory for Substantial Distributors

truck-man

a product of

YARD-MAN, INC.

1418 West Ganson, Jackson, Mich.

$675.00
F. O. B.
Jackson, Michigan

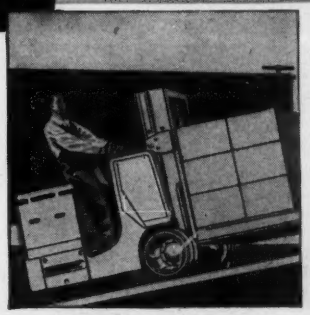
SAVE ENERGY . . . SAVE 30% to 60% IN HANDLING MATERIALS!

No matter what your product, there is an Automatic Fork Truck that will amaze you with its adaptability to handle any type of material in any kind of lifting, moving or stacking operation.

These trucks replace many hand trucks—provide you with extra storage space—are perfect feeders for production lines.

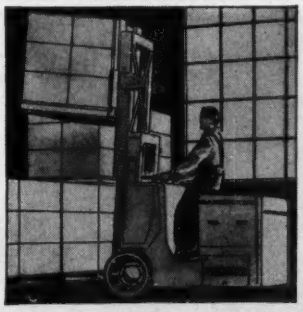
The record of those who use them shows handling costs cut 30% to 60%—workers enthusiastically efficient with their new-found freedom from gruelling, back-breaking work. Mail coupon for complete information.

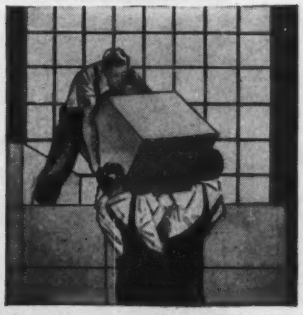
WITH Automatic FORK TRUCKS



THE RIGHT WAY

THE WRONG WAY





Amazing New Postwar Transporter

Don't buy any motorized hand truck until you see the new Postwar Transporter. Three easy, quick pumps of the foot pedal lift the load sufficiently to move with "touch-of-your-thumb" ease. Easy to get at power unit—new safety brake action. New efficiency, longer life has been added to this Miracle Electric Truck that cuts handling costs up to one-half! Mail coupon.

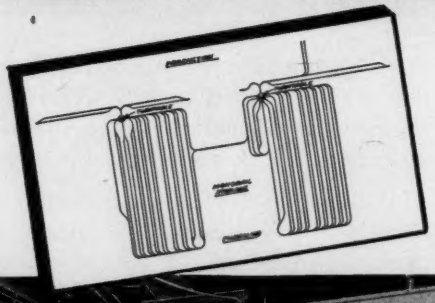
Automatic
ELECTRIC TRUCKS
Lighten LIFE'S LOADS

AUTOMATIC TRANSPORTATION COMPANY [illegible]
141 West 87th Street—Dept. K, Chicago 20, Ill.
Please mail me without obligation, complete facts about Automatic Fork Trucks.
( ) New Postwar Transporter
( ) Have an A.T.C. Specialist survey my material handling costs

Company Name.....
By..... Position.....
Street Address.....
City..... State.....

FLEXIBILITY

of AMERICAN MONORAIL EQUIPMENT Solves Difficult Handling Problems



Here is another of the hundreds upon hundreds of handling problems efficiently and economically solved by American MonoRail Overhead Handling Equipment.

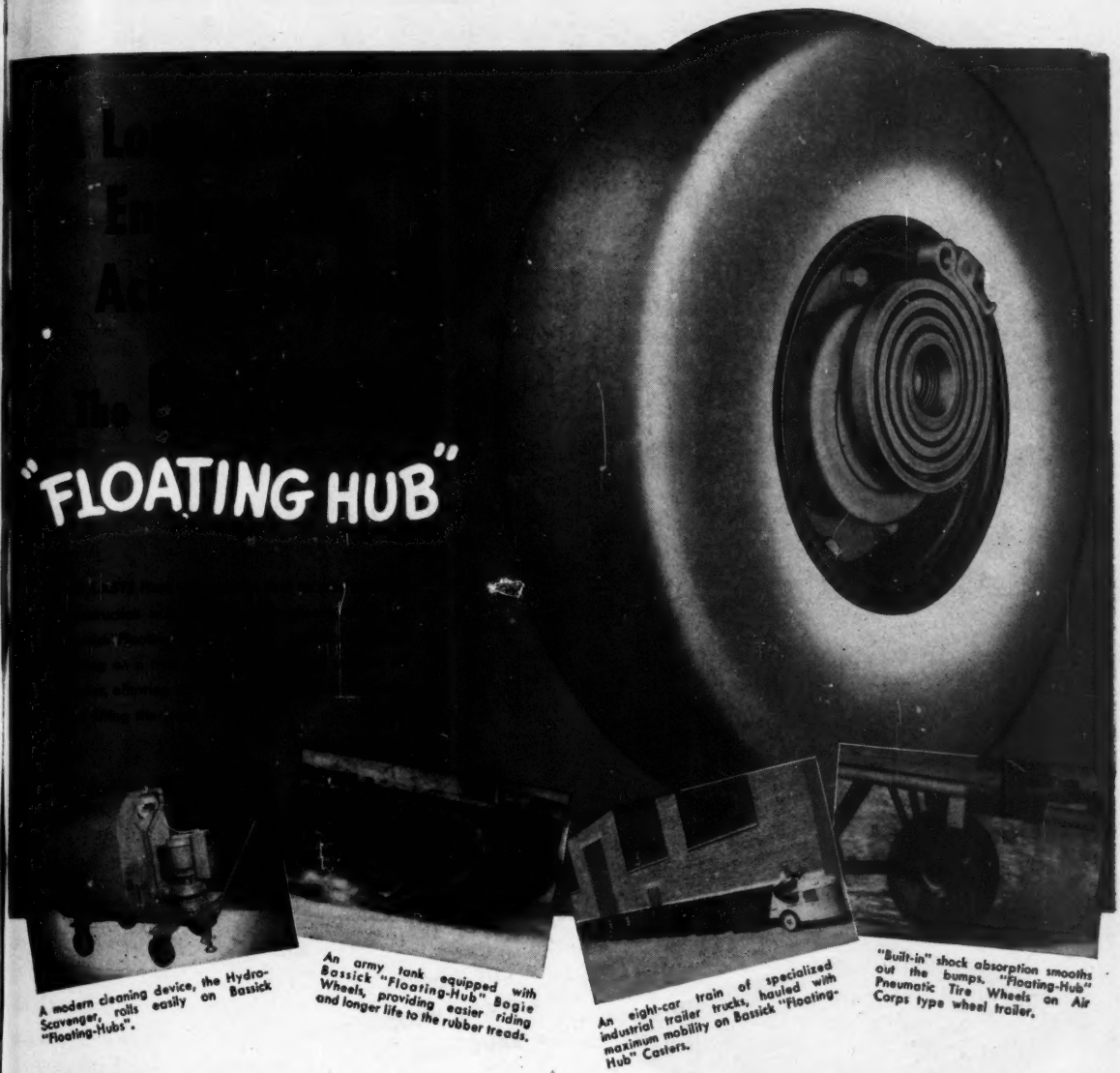
THE PROBLEM: To eliminate manual handling of reels from production machines to storage, from storage to finishing, from finishing to storage or shipping as required.

THE ANSWER: The FLEXIBILITY of American MonoRail switching arrangements permits reels to move on carriers with no rehandling between processes. Ample live storage is allowed, permitting free movement between all processes.

What is your handling problem? American MonoRail Engineers come up with the answer to efficient and economical handling ninety-nine times out of a hundred. We invite your inquiries.

THE AMERICAN MONORAIL COMPANY

3129 ATHENS AVE. • CLEVELAND 7, OHIO



A modern cleaning device, the Hydro-Scavenger, rolls easily on Bassick "Floating-Hubs".

An army tank equipped with Bassick "Floating-Hub" Bogie Wheels, providing easier riding and longer life to the rubber treads.

An eight-car train of specialized industrial trailer trucks, hauled with maximum mobility on Bassick "Floating-Hub" Casters.

"Built-in" shock absorption smooths out the bumps. "Floating-Hub" Pneumatic Tire Wheels on Air Corps type wheel trailer.

The "Floating-Hub" Wheel absorbs shocks, dampens vibration, protects loads and operating surfaces, gives longer life to equipment . . . this is not just another inventor's dream or experiment. It has been standing the tests of actual use. Many sizes of Bassick Casters and Wheel Mountings are now in use with "Floating-Hubs" . . . but many fields of possible service for this outstanding engineering achievement are still unexplored.

Bassick engineers will be glad to give consideration to special applications. Write to THE BASSICK COMPANY (World's Largest Manufacturers of Casters), Bridgeport 2, Connecticut. Division of Stewart-Warner Corporation. *Canadian Division:* Stewart-Warner-Alemite Corporation, Ltd., Belleville, Ontario.

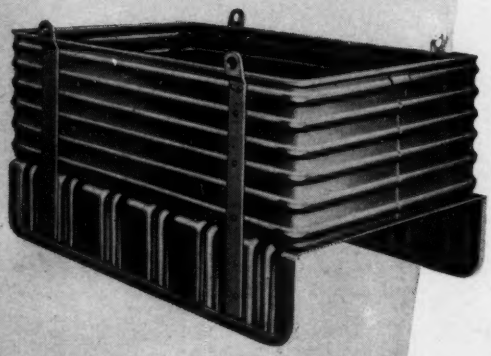
Making more kinds of Casters... Making Casters do more

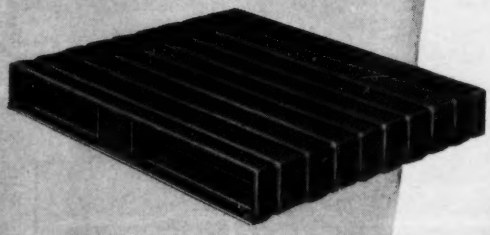
Bassick

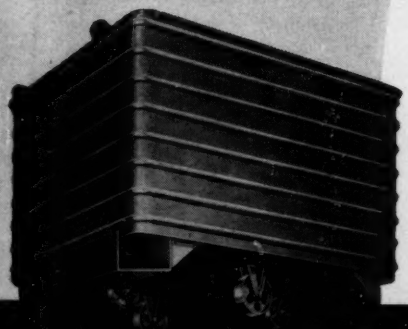
3 Strikes on Handling Costs

with UNION METAL *Engineered*

skids, boxes, pallets "pitching" for you







UNION METAL's extensive line of materials handling equipment has proved its superiority to the satisfaction of busy plant men in every field of American industry. Hard-job experience showed them how these "tools"—rugged, steel skids, boxes and pallets . . .

- **CUT COSTS**
- **SPEED PRODUCTION**
- **SAVE TIME**

because they're *engineered* for the job.

Expert designing by top-flight materials handling engineers makes Union Metal equipment do the job and do it better. They help you gain floor space for greater production economy—handle raw materials or finished product in time-saving and cost-saving unit loads.

Stock items to meet standard requirements—special designs for your special needs. For complete information and able engineering assistance write The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Materials Handling Equipment

KEEP TRUCK BATTERIES UP

...with "STRATEGIC SPOTTING"

OF G-E BATTERY CHARGERS

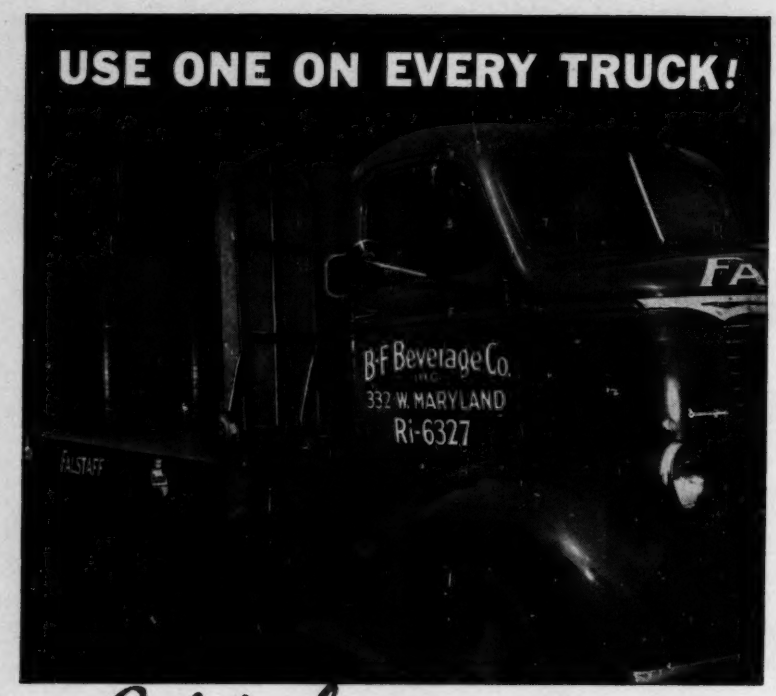
Handling materials throughout the plant and warehouse is faster, more economical, if your electric trucks are kept up to par. By the "Strategic Spotting" of G-E copper-oxide rectifying units right in heavy traffic areas, there's less time out for battery charging. And local installations are always ready to give a battery a quick "noon-hour" boost to keep trucks rolling.

Completely automatic, G-E copper-oxide chargers are simple to use. Your driver sets the control and the charger takes over to finish the job, cutting out when charge is complete. There's no danger of overcharging. G-E copper-oxide chargers for lead-acid batteries, for nickel-alkaline batteries, and for combination use are priced low, and are made in capacities to meet your battery needs.

For illustrated booklet and complete information, write Section A9-7137, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC

USE ONE ON EVERY TRUCK!



THE *Original* WHEEL-EZY $10.25

MODEL CK-45-NH NICRO STEEL WHEELS . . .

WITH RUBBER WHEELS (MODEL CK-45-AGH) . . . $13.25

Here is the lightweight hand truck which gives you top quality at lowest price. Tremendously strong, *WHEEL-EZY* will carry as many as five loaded cases up and down steps, over ramps and thresholds with balanced ease. Simply hung on the truck, it can be lifted down quickly by the driver at each delivery stop . . . saves his energy and allows him to accomplish more daily.

Rapids-Standard *WHEEL-EZY* trucks have single or double handles . . . open or solid "shovel-type" nose . . . with the wheel of your choice. Overall height 45½", overall width 20".

Break away from old-fashioned "case-at-a-time" handling methods! Put a *WHEEL-EZY* on every truck in your fleet and watch how quickly they pay for themselves.

ORDER NOW

THE RAPIDS-STANDARD COMPANY, INC.

577 Peoples Nat. Bank Bldg.
Grand Rapids 2, Michigan

When solid nose is desired put figure "1" in model number, as "CK-145-NH".

Quantity		Handle Single	Handle Double
☐	CK-45-NH	$10.25	$11.25
☐	CK-45-AGH	13.25	14.25
☐	CK-145-D-GP	20.95	21.95
☐	CK-45-GP	19.95	20.95

All prices F.O.B. Grand Rapids, Michigan

COMPANY .....

NAME .....

ADDRESS .....

To FLOW:
One Example Among Many

I was very much pleased to see the February issue of FLOW. Mr. Ewig joins me in congratulating you on the nice job you did in presenting the story of the handling practices in our Foundry. I have shown my copy to a great many people who have come to my office.

We could use at least a dozen copies of this February issue.

Is the article and type still standing and would it be possible to make arrangements to get reprints of the article? We could make up a suitable dummy, using the material just as you may have it standing, and then give you an order for reprints.—Charles M. Reesey, Cincinnati Milling and Grinding Machines, Inc., Cincinnati, Ohio.

To FLOW:
500 Copies

Before writing you (regarding the April issue of FLOW) I wanted to get the reaction of the Sales Department. In their opinion the article was very well done, and they wish to know if you can furnish us 500 copies of the magazine. —R. M. Whitson, Swift & Co., Chicago.

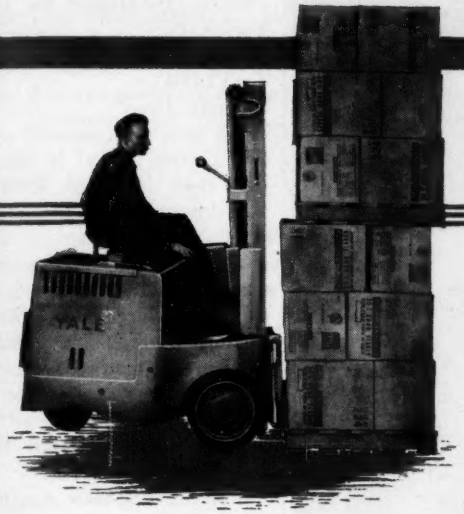
Reader Whitson is referring to the April article, "Bring Home the Bacon," page 32. Unfortunately we could not take care of his request for 500 copies since the issue was already off the press. A few extra copies can usually be furnished from our normal supply, but requests for large orders must be anticipated so that we in turn can include the amount in our print order. Such orders must be received not later than the 20th of the month preceding the publication date.—Ed.

To FLOW:
Many Are Saying It

I might mention at this time that I think you are doing an outstanding job in connection with your magazine FLOW. We hear a great deal about it in getting

POWER
THAT PACKS A
PUNCH

Here's a Reason why



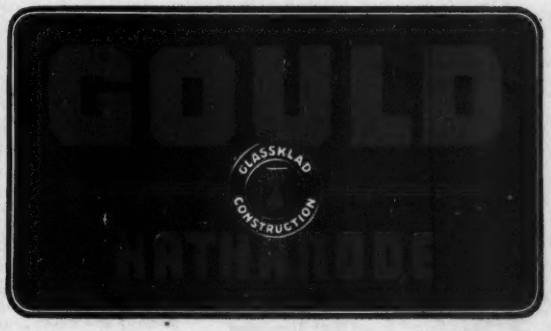
GOULD KATHANODE BATTERIES
Deliver More Peak Voltage

Kathanode equipped electric industrial trucks have the punch necessary to meet unusual conditions. They will climb ramps, and have the extra power to operate hoists while the vehicle is still in motion.

THE BATTERY PICKED BY ENGINEERS

The Gould Kathanode grid has double-wedge shaped members that securely hold the active material, yet expose only a knife-like edge to surface erosion. Grids are tapered at the top for extra conductivity thus delivering more power at the terminals.

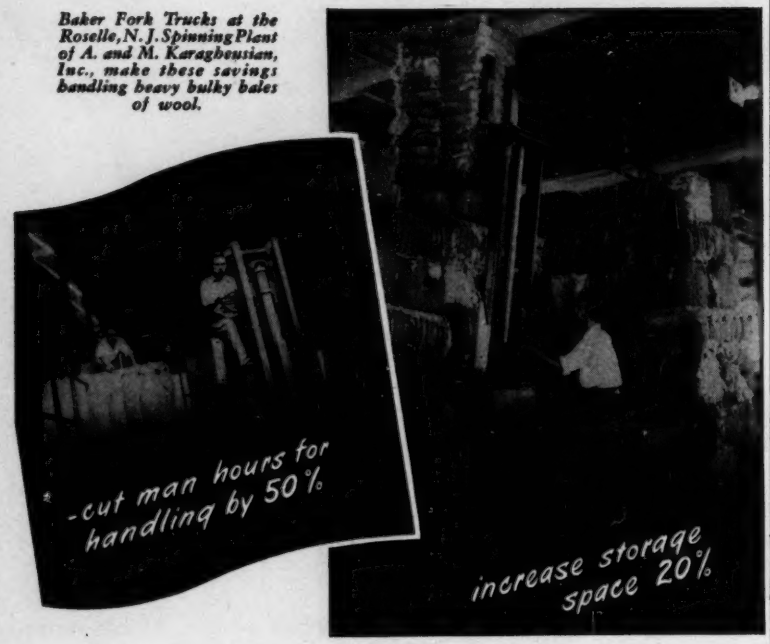
This grid is an exclusive Kathanode feature that provides more power and longer life. For all the facts write Dept. 77 for Catalog 100 on Gould Kathanode Batteries for Industrial Truck and Tractor Service.



GOULD STORAGE BATTERY CORPORATION, Depew, N. Y.
Service Centers: Atlanta • Boston • Buffalo • Chicago • Cincinnati
Cleveland • Detroit • Kansas • Los Angeles • New York
Philadelphia • Pittsburgh • Portland • St. Louis • St. Paul
San Francisco

Baker Trucks at the House of KARAGEUSIAN

Baker Fork Trucks at the Roselle, N. J. Spinning Plant of A. and M. Karagheusian, Inc., make these savings handling heavy bulky bales of wool.



This company is one of the world's largest manufacturers and importers of Chinese and Persian carpets, as well as a leading manufacturer of domestic rugs. Bales of wool, weighing from 350 to 1200 lbs. are received in carload lots from all parts of the world. The Baker Fork Trucks unload these bales and transport them to storage and processing departments—saving up to 50% in man-power hours over former methods. One of the trucks stacks bales for storage to a height of over 200 inches, enabling the company to use up to 20% more warehouse space.

At the Roselle plant, the wool is processed by washing, scouring, dyeing, and spinning into yarn. It is then shipped to other plants where it is woven into the nationally known "Gulistan" rugs for which the House of Karagheusian is famous.

Our files contain many case histories of Baker Trucks making similar savings in all types of plant and warehouse operations. A Baker Material Handling Engineer will gladly show you how they may be applied to your problem.

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2185 West 25th Street • Cleveland, Ohio
In Canada:
Railway and Power Engineering Corporation, Limited

Member:
Electric Industrial Truck Association

Baker INDUSTRIAL TRUCKS

around to the various people we contact.—E. M. Abramson, Ohio Equipment Co., Inc., Cleveland.

Reader Abramson's compliment is backed by the opinions of many users of mechanized material handling equipment.—Ed.

To FLOW:
A Toast from Canada Dry

We find your magazine interesting and helpful.—W. A. Bleecker, National Transportation Manager, Canada Dry Ginger Ale, Inc., New York City.

To FLOW
"Drums Away"

We note with interest your article "Drums Away" in the December 1945 issue of FLOW, and would appreciate more information on it.

The idea we have in mind is to operate such a drum holder by using our large Ross lift trucks. Any suggestions you may have will be appreciated.—R. S. Glidden, Manager Production Control, The Brunswick - Balke - Collender Co., Muskegon, Mich.

The drum holders shown on page 39 of the December 1945 issue were invented by Western Freight Handlers, Inc., San Francisco, Cal.—Ed.

To FLOW:
Copra in Sacks

Please send us a current issue of FLOW.

We are particularly interested, at this time, in sack stacking equipment for stacking copra in sacks weighing 150 to 160 pounds each, to a height of 40 to 50 feet.—E. D. Woellner, The Procter & Gamble Co., Cincinnati, O.

Various types of sack stacking operations have been shown in the past issues of FLOW.—Ed.

To FLOW:
From the Fruit Country

A copy of your magazine FLOW came into our hands, and we are very much interested in handling equipment. Please find our check for $2.00 for a year's subscription, starting immediately.

We have a problem that we are at present trying to solve, and perhaps you can be of some assistance to us. We have cold stor-

age rooms 15 feet in the clear in which we pile apple boxes 14 to 15 high. The fruit enters the cold room by means of belts. Our problem is to elevate these boxes into the stacks. The room is used for storing apples loose in unlidded boxes, also packaged fruit. Therefore, the machine must be light, portable, electrically operated, and a straight lift.

If you can put us in touch with anyone who makes this type of equipment, we would appreciate it very much.—L. J. Bunting, Rainier Fruit Co., Yakima, Wash.

Reader Bunting has received the desired information promptly.—Ed.

To FLOW:
Growing Lustily

We enjoy your magazine FLOW very much, and wish you continued success.—Plastic Service Co., Milwaukee, Wis.

FLOW'S paid circulation has more than doubled since its inception a few months ago—an unusual performance for a magazine. FLOW is showing signs of vigorous growth month by month.—Ed.

To FLOW:
One Among Many

We are wondering if you could advise the writer where we might obtain a quantity of skids and a one-skid lifter, preferably motor-driven. We will appreciate any information you can give us in this connection.—L. M. Mayer, President, Cole-Hersee Co., Boston, Mass.

Many inquiries of this kind are received monthly. Information is furnished readers on an impartial basis so that they may be able to make the most suitable selection among the products offered by FLOW advertisers.—Ed.

To FLOW:
Chip Handling

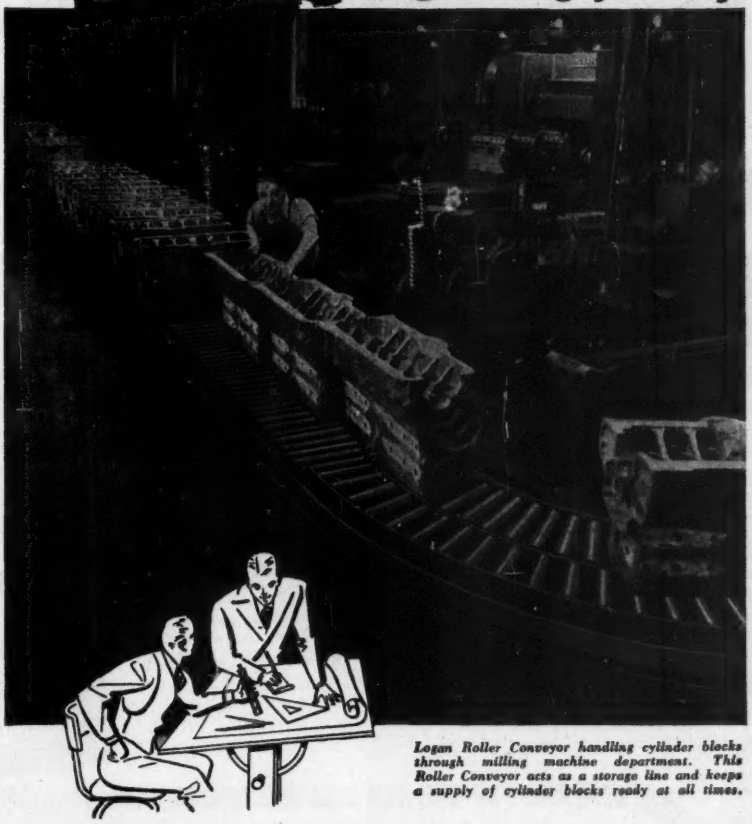
You did a fine job on my article, "Goodbye, Messy Chips." I want to congratulate you also on the splendid work you are doing in getting out the whole magazine.—S. Reibel, Albert Kahn Associated Architects and Engineers, Inc., Detroit.

This article in the April issue dealt with one of the largest aluminum chip handling systems ever built.—Ed.

Engineering

. . IS OUR BUSINESS

. . look well to the Engineering you buy



Logan Roller Conveyor handling cylinder blocks through milling machine department. This Roller Conveyor acts as a storage line and keeps a supply of cylinder blocks ready at all times.

FREQUENTLY, the "unseen factor" is the one that counts! And this is particularly true of the *engineering* in the conveying equipment you buy.

Logan Conveyors are the first choice of many of America's leading industrial organizations, not only because of their quality and construction, but because of built-in engineering features that "click."

To build a conveyor—and a good one—is comparatively simple for any established manufacturer, but to *engineer* a conveyor system *to meet the requirements of your particular problem* is something else indeed. That is why we repeat: "Look Well To The Engineering You Buy."

LOGAN CO., INC., 558 Cabel St., Louisville 6, Kentucky

Logan Conveyors

PUT *FLOW* INTO PRODUCTION

FREE ENTERPRISE
is the newest and best system. All the "new ism's" are in reality old failures in clever disguise.

35 YE… PUT HANDLING EXPERIENCE TO WORK FOR YOU

A pioneer in the materials handling field, Mercury has over 35 years in the designing, manufacturing and installation of materials handling equipment. This experience is engineered into every Mercury Tractor, Trailer and Lift Truck.

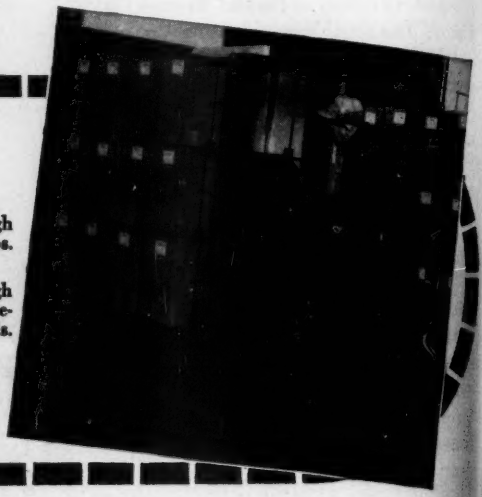
FORK TRUCKS

Available in the following models:

"JEEP" Sit Down, Center Control Fork Truck: 2000 lbs. capacity. Easily maneuvered in limited areas.

"YAK" Center Control Fork Truck: 4000 lbs. capacity. Rugged design.

"YANK" Center Control Fork Truck: 6000 lbs. capacity. Tough continuous service.



ELEVATING PLATFORM TRUCKS

Available in the following models:

"JUNIOR" Models: Low, high and telescopic lift types. 4000 lbs. capacity.

"SENIOR" Models: Low, high and telescopic lift types. 4000 lbs. capacity.

"STANDARD" Models: Low, high and telescopic lift types. 6000 lbs. capacity. Sturdy design.

"MOGUL" Models: Low and high lift types. 10,000 lbs. capacity. Designed for unusually heavy loads.

TRACTORS—TRAILERS

Available in the following models:

"TUG" Electric Tractor: Powerful compact tractor available in twin-wheel and 4-wheel models, medium or heavy duty.

"BANTY" Gas Tractor: Most compact tractor made, yet develops a draw bar pull in excess of 2000 lbs.

"HUSKIE" Gas Tractor: A powerful, 6-cylinder, 4-wheel tractor. Built to haul any wheeled load it might encounter in industry.

"SUPER-HUSKIE" Gas Tractor: Dual, rear-wheeled industrial tractor powered with 6-cylinder engine. Built for severe industrial service.

TRAILERS: Available in castor or 5th wheel steer, platform or side dump types.

MERCURY

THE MERCURY MANUFACTURING CO.
4154 S. Halsted St., Chicago 9, Ill.

TRACTORS—TRAILERS—LIFT TRUCKS

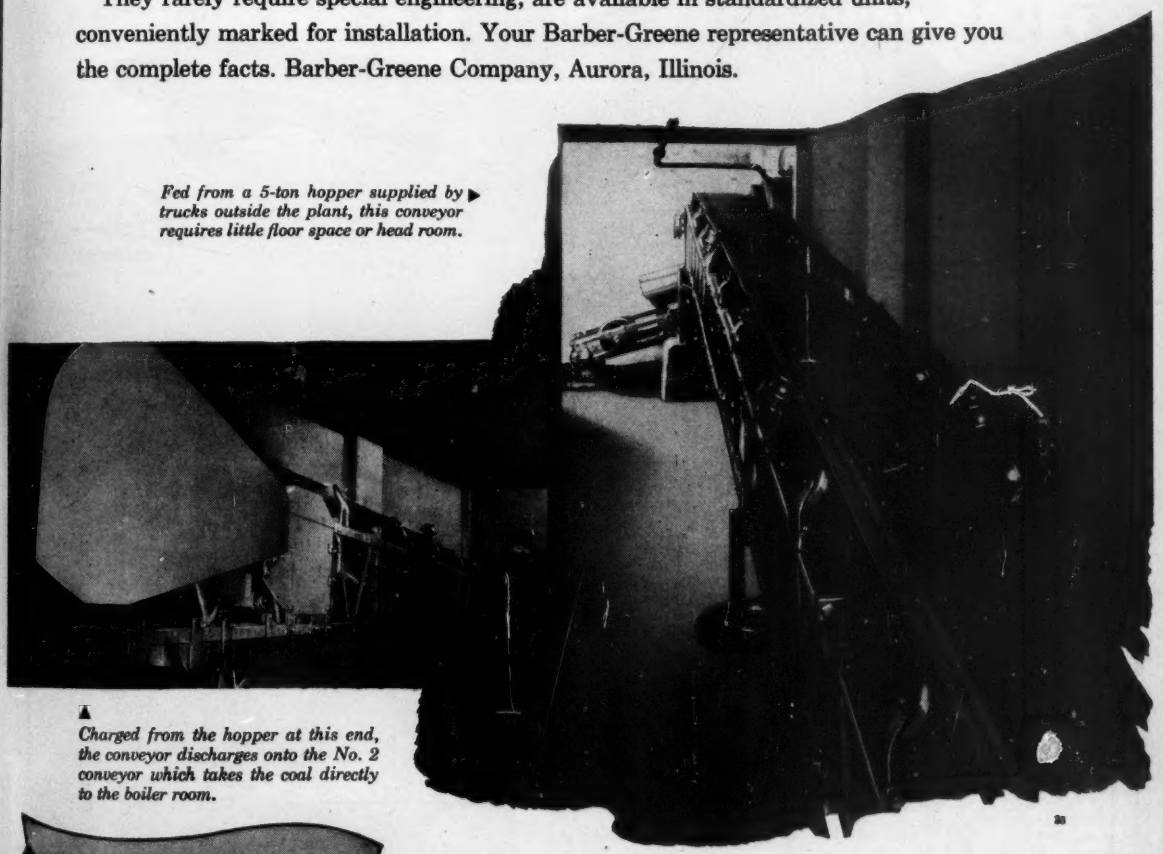
FREE: Mercury "Pocket-Catalogue"
For complete data on all Mercury equipment, including the latest additions to Mercury's expanded materials handling line, request Bulletin 201-6.

How BG *Conveyors* Can Streamline Your Coal Handling System

• If you want to cut costs in your plant heating system, Barber-Greene Belt Conveyors might well be the answer. They can eliminate costly rehandling: they can make your whole system more completely automatic to take the coal from storage to the boilers at a most reasonable cost per ton.

Pre-engineered Barber-Greene Belt Conveyors are quickly and simply installed. They require a minimum of space and so are ideally suited for installations in existing systems where quarters are crowded.

They rarely require special engineering, are available in standardized units, conveniently marked for installation. Your Barber-Greene representative can give you the complete facts. Barber-Greene Company, Aurora, Illinois.



Fed from a 5-ton hopper supplied by trucks outside the plant, this conveyor requires little floor space or head room. ▶

▲ *Charged from the hopper at this end, the conveyor discharges onto the No. 2 conveyor which takes the coal directly to the boiler room.*

BG Barber-Greene CONSTANT FLOW EQUIPMENT

LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACHINES

THE SALSBURY TURRETEER

More Easily Negotiates Sharp Corners...Tight Spots...Steep Ramps

The Salsbury Turreteer (platform type) is highly maneuverable, powerful, stable and simple to operate. It will carry a 4000 lb. load and operator at speeds up to 7 m.p.h. Saves time in picking up, transporting, and spotting skids. Has 3 in. hydraulic lift.

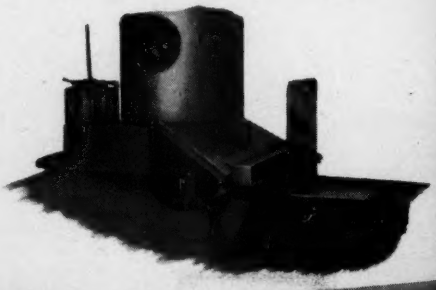
SALSBURY

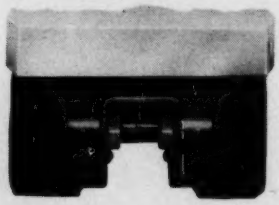
There's power inside the turret

The Salsbury Power Package, with its efficient 6 hp motor, automatic transmission and automatic clutch, is combined with the drive wheel in a single unit. Direction of travel is altered by revolving the turret, giving unusual maneuverability. Requires no batteries, no gear shift, no clutch lever, no reversing lever. Throttle and brake are the only controls.

Articulation insures shock-proof travel

Exclusive Salsbury articulation smoothes out the bumps. Four wheels are under the load at all times.





Husky and unusually stable

The Turreteer is equipped with extra wide, heavy, rubber-tired load wheels to insure stability and prevent load dumping.

For more information on Salsbury materials handling equipment, including the Turretug (tractor type), and the Turretruck (cargo type), write for Bulletin 4602-7.

SALSBURY MOTORS, INC.

1201 Lexington, Pomona, California
A subsidiary of Northrop Aircraft, Inc.

We'll Meet You More Than Half Way!

If You'd Like to See for Yourself—in Your Own Plant—the Savings in Labor, Space and Equipment You Get with

THE TURNER SYSTEM OF MATERIALS HANDLING

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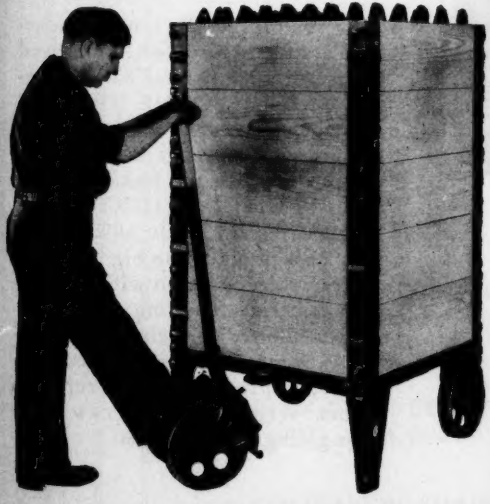

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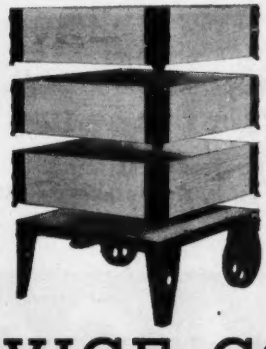

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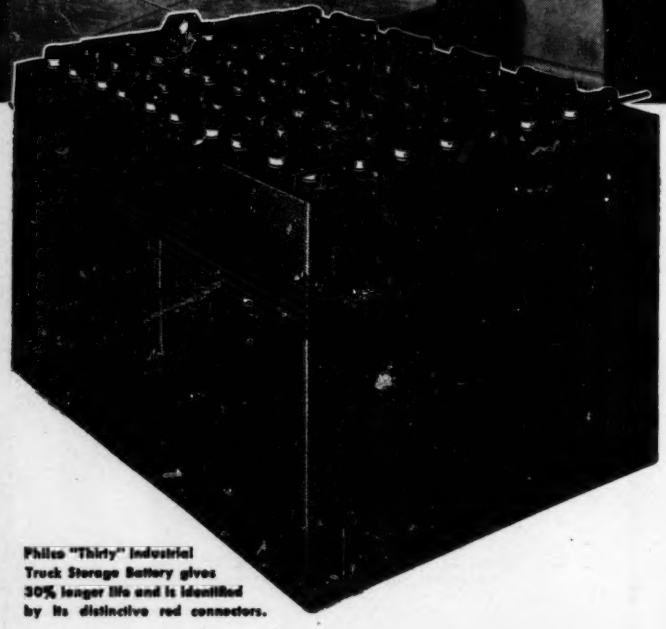

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The magazine which integrates material handling equipment into the flow of production.

Vol. 1, No. 10

JULY
1946

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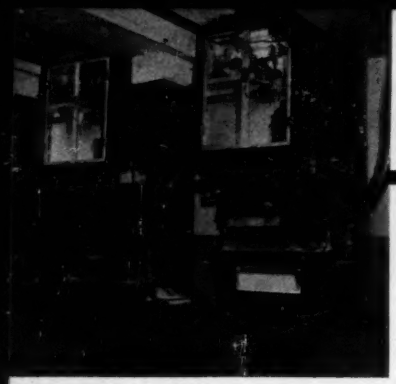
COVER PHOTO—Assembly of pole line hardware items at Joslyn Manufacturing Co.'s Chicago plant. Work flows from right to left, and packing is done directly on skidded loads. See article "Tools That Aid Incentives," page 28. It indicates how proper handling facilities help realize potentialities of profit-sharing.



Automatic weighing devices. Material drops through chutes on belt conveyor, foreground, on way to furnace.

HIGH SPEED LINE F

Here's how the Ford Motor Company's River Rouge plant mass-produces safety glass for its cars and trucks. A number of interesting handling devices are coordinated in this operation.

IN THE end of a building measuring several hundred feet in width, and over a thousand feet in length, is the receiving department for the raw materials used in making the glass. Enclosed hopper cars loaded with soda ash, silica limestone, salt cake, and other ingredients are positioned over pits set below the railroad tracks. Following unloading, the bulk material is carried from here by bucket conveyors under the floor to the column line about 75 feet away. This permits access to the floor area next to the tracks for shipping purposes also. At the point where these peck carrier type conveyors meet the column line, the material is carried vertically to a balcony where it is deposited into horizontal belt-type conveyors to the concrete silos.

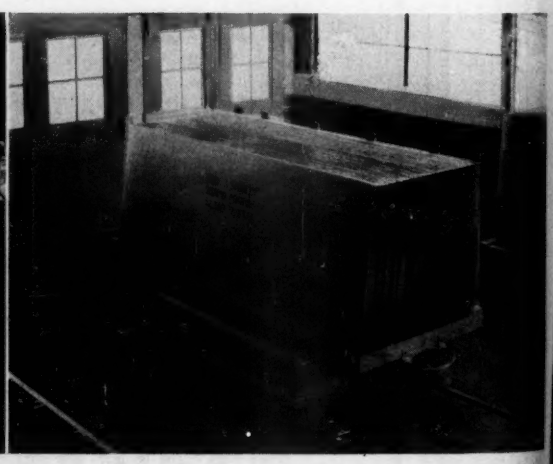
As the materials must be accurately measured, scales are placed at various locations in these lines to weigh them automatically. The weighed portions pass through to be fed into the huge furnace. Formerly, the apportioned materials were made into brickettes before being fed into the melting furnace. Through experience and study the company found it more economical to supply these ingredients direct to the furnace in loose form as at present.

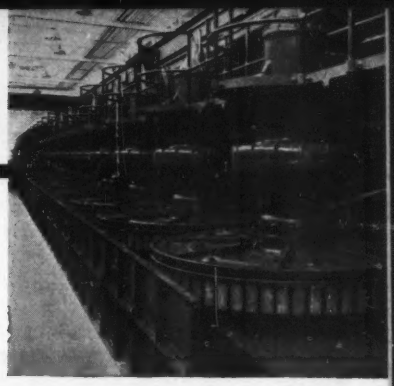
As the materials enter through a screw conveyor, they pass into a temperature of 2600 degrees F. The furnace is an immense tank 117 feet long and 22 feet wide. The seething mass in it amounts to approximately 950 tons of molten ingredients. About 90 tons flow from here each day. Upon leaving, the hot mass is squeezed between two heavy rollers which form it into a strip 46 inches wide. A lehr (cooling chamber) located in line with these rollers, receives the 1200-degree strip and carries it on a roller bed for 400 feet. This permits the continuous plate to cool to 120 degrees when it reaches the end of the lehr.

Following cooling, the glass is cut into sheets while it is positioned on a gravity roller section with rubber covering to protect the plates. All of these operations are handled on the balcony or mezzanine floor, while the grinding and polishing of the plates is done on

Inspector checking continuous glass strip emerging on rubberized rollers from the lehr, or cooling chamber.

Temporary storage of glass sheets on flanged-wheel car mounted on standard railroad tracks. Rubber-tab transfer conveyor is shown at left of photo.





Three-hundred-foot-long grinding wheel line. Planer-type table in foreground carries glass below wheels.

NE FOR SAFETY GLASS

the main floor. After cutting, the sheets are ready to be lowered to the floor below.

Novel Elevator Used Between Floors

This transfer from one level to the other is accomplished by a side-mounted elevator constructed of rubber covered gravity rollers. When it rises to lower a cut pane, the gravity rollers mesh with those supporting the glass, and the latter drop away in trap-door fashion, leaving the sheet resting on the elevator. The elevator deposits its load on powered rubberized rollers below, meshing as above and proceeding on until the glass is carried away. When the plates move on, the elevator ascends for another load.

Because the furnace produces glass seven days a week, while the grinding and polishing lines run only five, the sheets are temporarily stored before being fed into these lines. The panes are carried away from the main flow by a series of chains upon which are mounted small rubber tabs. Mounted on six-inch centers, the chains move at right angles to the main line, driven by a series of sprockets. This movement is reversible, allowing both removal and return of the glass.

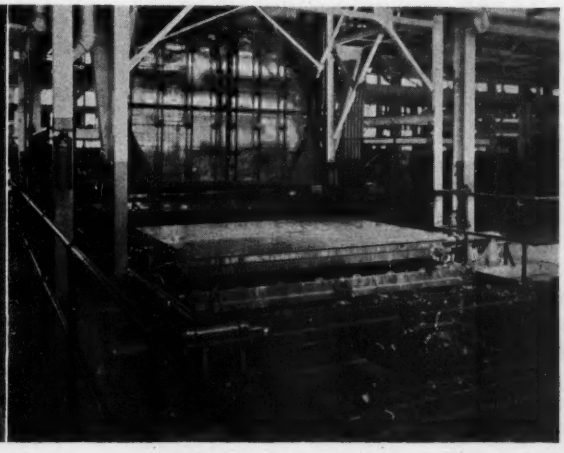
During the temporary storage mentioned above, the glass is placed on transfer cars, which run on standard gauge railroad tracks. Stacked on their edges, 280 sheets can be stored on these cars, producing a weight of over 13 tons. The transfer cars are moved away from the point of loading on a siding, from which they can be returned to the grinding and polishing lines.

Levigation System in Grinding

Each sheet of glass must pass through a series of machines, which grind the surfaces and remove all unevenness and waves. The grinding agent used is sand, and the medium is water, but to get the correct mixture of each was a problem. It was solved by using a levigating system. The sand and water solution is fed into the top of a large tapered vertical tank adjacent to the grinding machine which it supplies. Within this 15-foot-high container are located baffle plates, which allow only a certain portion of sand and water to flow down. By adjusting these baffles, different size particles of sand are obtained so each grinding operation can be regulated to remove succeedingly less material from the surface of the plates.

During the grinding process, the plates are conveyed on iron planer-type tables. These tables are covered with plaster which retains the two planes placed side by side.

Levigating system feeding sand and water to grinders on the main floor. ● "Butterfly" transfer frame vertically suspending two plates which are being turned over to grind opposite side.



The success of this grinding depends to a large measure on the levelness of the square ways which hold the tables. Caissons were sunk to bed rock, which has resulted in a practically level length of over 300 feet.

The grinding wheels are another interesting feature in this grinding operation. They are made of charcoal iron and are approximately 10 feet in diameter and weigh five tons each. They are suspended from a heavy steel arm which extends over the moving line of glass. Positioning is so accurate that sheet thicknesses can be maintained within a few thousandths.

Putting on the Polish

From the grinding to the polishing operations, the sheets must be transferred from one line to the other. The heavy table holding the large panes moves into "dead" zone, where the glass is fed at right angles away from the oncoming tables by a chain drive. When the glass arrives at the starting position of the rough polishing line, it automatically moves from the switching device, and returns to the square ways of the polishing line.

The rouge polishing is similar to the grinding, so far as the handling of the plates is concerned. However, the glass is polished by several smaller felt padded wheels in the 10-foot diameter rather than one large one, as previously described. Each table is pushed along mechanically by the succeeding one, which results in a continuous flow of glass under the polishing wheels, as in grinding.

Now the Other Side

Now the sheet of glass is polished on one surface only. The next step is to turn the sheet over in order to grind and polish the other side. To do this difficult task, a method was devised whereby, mechanically, this fragile material could be picked up and deposited with its reverse side up.

A device was constructed which consists of two frames (of the same over-all dimensions as the unit of two panes), which are hinged to a common bracket support. To each of these are mounted, on 12-inch centers, suction cups about three inches in diameter. As the sheets of glass move under these frames, they descend and the nearest frame attaches itself to the glass. Moving five feet vertically with the load attached, the two frames converge downward, like the wings of a butterfly. The suction cups on the free frame contact and hold the plates, while the opposite cups are released. The frames then separate to a horizontal position, and the plates are lowered and deposited on the waiting table.

The glass now continues through the grinding and polishing operations as before. After polishing, it is ready for inspection and cutting into bracket sizes.

Rubber Slings and Special Truck

Before inspection, the panes are washed to remove any remaining rouge or plaster. Hanging in rubber covered, J-shaped slings, the glass is carried on its edge through a series of acid washing machines. Upon emerging, it is fed onto rubber covered rolls, which are set on a 45-degree angle, spaced 12 inches apart. Fluorescent lights beneath shine through the panes, showing the inspectors any imperfections.

Final inspection of plates which are supported on rubber "mushrooms" mounted on chain conveyor.

Operators shown making the glass "sandwich." Novel conveyor rollers give tortional feed.

Through the succeeding operations the glass passes along on a rubber belt about four feet wide and extending some 300 feet. Here, too, the 45-degree angle is maintained to permit easy access across the 46-inch width of the panes. The belt also provides the correct amount of friction necessary to transport the glass and cushion it.

Following inspection, the glass is marked and cut to template sizes on a pantograph cutter. When the operator removes the scored pane from this machine, the glass outside the score line is broken away and deposited on a return conveyor below the main rubber belt. The cullet (or scrap) is carried to a hopper from where it is conveyed to the furnace to be mixed with a new batch. Hence, you do not see broken glass lying on the floors or elsewhere.

When the glass is cut to size, an operator hangs the pane on another monorail conveyor equipped with rubberized sling carriers by which it is carried through a washing process. The panes are then stored temporarily before lamination. Special four-castered racks are used to hold the sized pieces. For small panes (such as side windows in

the front car door), the racks are two tiered, while for larger sizes one tier is used. The back rests on both are slanted for easy positioning in loading and maximum protection for the glass. Rubber strips aid also in the elimination of chipped edges. Operators remove the panes from the slings, and place them on edge with about 100 panes to the tier. Here they remain until they are removed for further processing in the laminating line.

The "Sandwich" Filler

Vinyl plastic is the filler which is placed in the "sandwich" formed by the two layers of glass. As the vinyl absorbs dirt, moisture, and other impurities, it must be handled in an air-conditioned medium. A continuous line of rooms are used for this purpose, with a conveyor passing through them. Air locks placed at the junction of each section assure optimum atmospheric conditions.

This plastic is received in bolts, much the same as yard goods, and the surfaces have been previously powdered to prevent any sticking. At the start of the line, a heavy rod is inserted through the core of the bolt, and it is hung by this on a rack. From here, the material is unfurled and fed through a cleaning and brushing machine, which removes most of the powder.

The plastic is fed into a festoon furnace which dries and normalizes it at 130 degrees F. From this point, the material passes into a room where a stacking device neatly piles it into loose folds. After the desired amount is obtained, the long, continuous strip is cut, and the material is stored on racks for a 24-hour conditioning period. The material is then ready to be cut to template sizes.

Plastic Requires Careful Handling

Since this vinyl plastic is used in many different sizes of automobile windows, it must be cut to the correct template size for these windows. Long tables are used for holding the material during cutting, which are positioned in line with the regular flow. Operators on both sides of these tables cut out the shape desired, and then feed the pieces onto a belt-driven conveyor with wooden rollers set on about 6-inch centers. These carry the plastic pieces through a washing machine and then through two 12-inch diameter rollers, which are covered with soft cloth. This material absorbs the moisture, and drying is also aided by fans mounted at the ends. Two stand-by rollers are used. The pieces are now ready for assembly between the glass.

Making the Glass "Sandwich"

From the storage racks previously mentioned, the glass is placed on a powered conveyor which carries it into another washing room. This is in a line with the other laminating processes. After washing and drying, the plates are carried on the same conveyor to the assembly room, arriving slightly below the vinyl plastic line. The plastic arrives stacked on wooden trays and is positioned at various points on either side of the line. The glass enters on a wooden roller powered conveyor for assembly. An operator lays a sheet of vinyl plastic on alternate panes as they move by, while the next operator places the panes without any vinyl on top.

The unit is next "tacked" in a continuous furnace, from where it is placed in "bottomless" cylindrical holders prior to fusing. These are about four feet in diameter with an outside casing 12 inches wide from top to bottom. The inside has sections which allows the pressure to react on all the surfaces of the glass. With the glass stacked on edge, four such containers are placed one on the other. These are lifted by an overhead hoist and lowered into a large autoclave. After fusion is complete, the glass is transferred to the second floor via another sling type conveyor, where the edges are finished.

Finishing and Shipping

As the plates arrive in the finishing department, they are removed and the edges are ground.

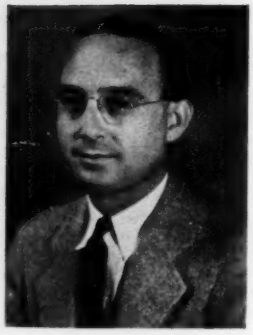
An interesting conveyor is used in this department which consists of wooden "pickets," mounted in twos opposite each other on a powered woven belt. The pickets are about six inches high and are spaced the thickness of a pane apart. The glass is set on edge and fed around this oval layout, through the various stages of edge-grinding. After these operations are completed, the windows are returned to the sling-type conveyor. The glass is again washed and inspected for scratches, which are removed, and any chipped panes are salvaged and returned to be cut to smaller units. The panes are now ready for the shipping

(Turn to page 46)

***FOR RECEIVERS AND SHIPPERS**—Among the many time-saving devices usually found in the well-equipped receiving and shipping department is a "car door puller." There are several makes on the market. This*

device is designed for the purpose of reducing the job of opening or closing freight car doors to a one-man operation. The photograph illustrates the simplicity of operating the equipment.

solving some *Unit Load* problems



By A. J. AUBIN

Superintendent
Material Handling and Transportation Department
Hammermill Paper Company, Erie, Pa.

Wet pulp material . . . products in paper sacks . . . cartoned goods . . . centralized warehousing and shipping—how the Hammermill Paper Company is solving a manifold handling problem.

THE Hammermill Paper Company, as I stated in last month's article, also adopted the pallet unit load method at about the time it instituted a centralized material handling department. *(See "The Answer to Your Cost Control Problem," June FLOW.—Ed.).* These innovations came about as a result of an exhaustive study made by our company's engineering department.

The unit load methods, the subject of this article, involves all of our manufacturing (raw), in-process and finished materials. Manufacturing materials come in many forms—laps, rolls, bags, etc. And we make about 3,000 kinds, sizes and colors of papers for business, which are packaged in literally scores of variously sized containers.

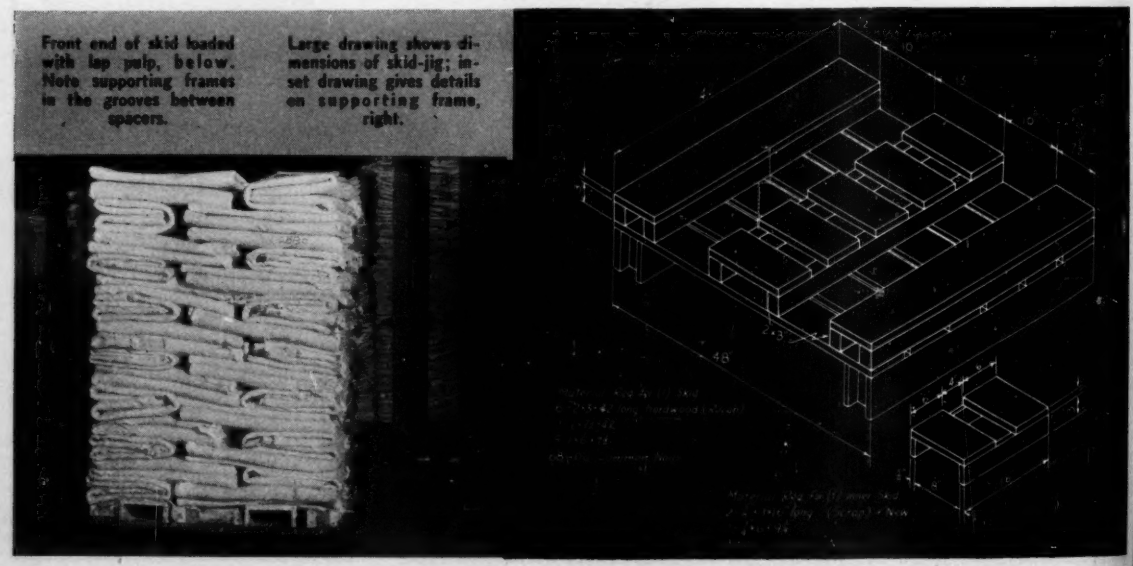
In view of the great diversity of products and sizes of packages involved—both raw and finished materials—a number of specific studies had to be made in order to adapt some of the materials to pallet handling. In some instances week-long studies were made by the material handling department in order to devise the most efficient method for a product that presented a problem.

Solving the Lap Pulp Problem

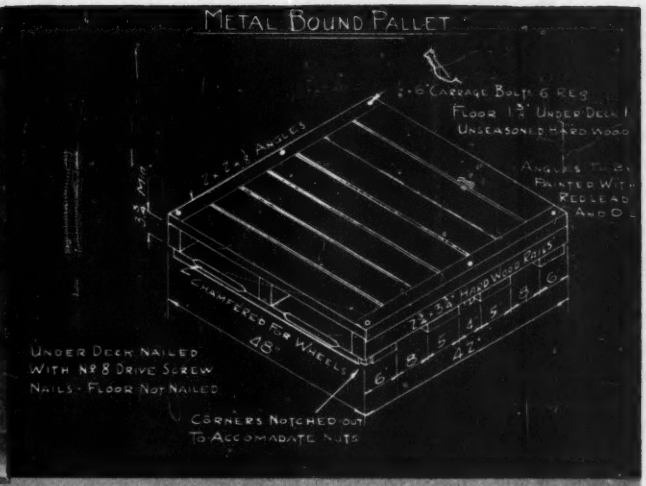
An example is lap pulp—sheets of wet pulp which measure about 17"x34" in folded (lapped) form. A certain grade of this pulp

Front end of skid loaded with lap pulp, below. Note supporting frames in the grooves between spacers.

Large drawing shows dimensions of skid-jig; inset drawing gives details on supporting frame, right.



The load of pulp is thus picked off by fork truck. When deposited in car, the frames remain under pulp.


METAL BOUND PALLET
UNDER DECK NAILED WITH Nº 8 DRIVE SCREW NAILS - FLOOR NOT NAILED
CHAMFERED FOR WHEELS
48"
42"
CORNERS NOTCHED OUT TO ACCOMADATE NUTS

Drawing of metal-bound pallet adopted for handling many bulk raw materials received in bags, photo above.

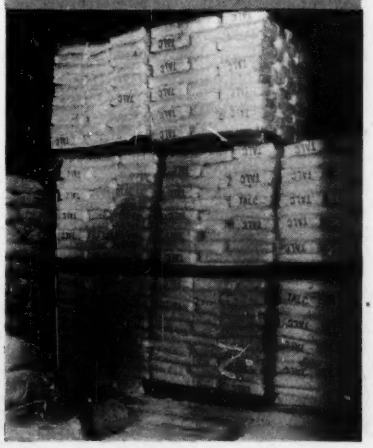
(screenings) is today shipped in unit loads, weighing about two tons each, to outside users. Previously these laps were loaded individually into outbound cars. The resultant saving of the unit load method has been considerable. But the solution was not found overnight.

After eliminating several tentative methods, we adopted a skid-jig (a skid with spacer strips) on which the laps were built into unit loads as shown in the illustrations. The spacer strips were of course designed for entry of fork trucks, and the pulp used to rest on the forks when the load was picked up. However, when the wet material was deposited in the cars we found it would not permit the truck operator to withdraw the forks without upsetting the load.

We tried wedges and other devices, but without the desired result. After further study, the material handling department designed the small supporting frame shown in one of the sketches on these pages. This frame, 16 inches long, eight inches wide and four inches high, proved to be the key to the whole project. The frame should be long enough to cover at least one-third the length of the truck forks, to permit their easy withdrawal after the load has been deposited. The width of the frame depends, of course, on the width of the forks.

The two frames are inserted at the front end of the troughs or grooves on the skid. (A pallet could be used instead of a skid.) The load of laps is built on top in the usual manner. When the loads are deposited in the freight car, the forks can be pulled away without any trouble from under the frames which are of course picked up with the plup. The withdrawal is easy even when the loads are double decked, which is regular practice here at Hammermill. The simple frames, made of scrap material, are left under each load. Their cost and weight are negligible.

Tiered loads of bagged material on metal-bound pallets. Company asked suppliers to ship unit loads.



Thus, by use of these supporting frames in conjunction with the skid-jig, we have overcome a situation that proved to be an obstinate problem for some time. With the previous manual method the loading of a car required 20 manhours, whereas the same job today is done in three hours. This enabled us to divert manhours to higher skills in productive operations.

Unit Loads of Carton Flats

During the course of a year our company receives a good many carloads and truckloads of carton flats (knock-down cartons). This material previously arrived loose in cars. The dimensions of these corrugated sheets vary from 36″x40″ to 42″x50″. The problem was to develop a standard pallet that would be adaptable to the various sizes. The material handling department drew up a number of sketches of various types of skids and pallets, until we arrived at the solution with a four-way entry pallet which measures 36″x44″. This size accommodates all the standard sizes of carton flats, and the overhang of the larger sizes is not sufficient to cause damage to the material.

The four-way entry pallet provided certain advantages. Since the units are received both in cars and trucks—which are not always

of a standard size—the four-way entry pallet enables us to make maximum use of load capacity. For these loads can be placed either the long way or the short way in cars or over-the-road trucks, utilizing space to maximum advantage. And since the forks can be inserted from either side, these pallets also afford flexibility while being handled in narrow quarters.

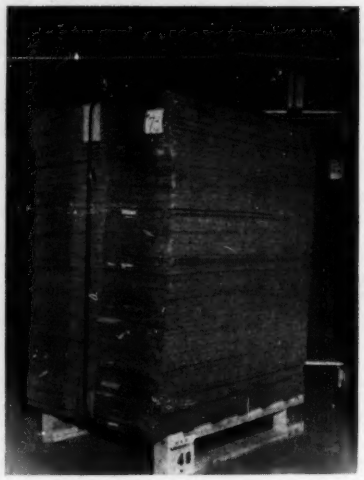
These unit loads are about 80 inches high, which is convenient for clearing car doors as well as for double decking in the warehouse. While the accompanying photo shows a load with only a single strap, we are now using a two-way strap for better support of the material. Corrugated paper inserts of double thickness at the corners are sufficient for strapping purposes.

Like the method designed for lap pulp handling, this four-way entry pallet has also contributed importantly to lower handling costs. Whereas it formerly required 24 manhours to unload a car of loose carton flats, today the same operation requires at most three hours. In this time is figured in 1½ hours spent by a helper who starts the car by clearing the doorway. It actually takes the fork truck operator no more than 1½ hours to unload the palletized units and move them to the warehouse. Again, the time saved could be used in productive operations.

Solving the Bagged Material Problem

Many types of raw materials are received in bags—talc, clay, starch and others, of which many thousands of tons are consumed annually. Since these products, some quite expensive, are packed in paper sacks, a major object in the conversion to pallet handling was also avoidance of damage loss and product protection.

A study convinced us that the bags would be torn if handled on the regular pallets that are used for the lap pulp. (This refers to pulp, not shipped out, which is produced for our own manufacturing operations.) The repeated drying of the pallets (after they have been wetted through contact with the pulp) causes the wood to shrink and the nails to pull loose from the runners. This would naturally result in damage to the bags. Consequently, we adopted the type of metal-bound pallet which is also



Carton flats on 4-way entry pallet.

shown on these pages.

The upper deck is fastened by use of carrage bolts, leaving a smooth surface free of any projections which might cause bag damage and spillage of the contents. Note that the bottom boards are notched out at the corners to accommodate the bolt heads. This pallet has proved very satisfactory, and it has also contributed to better housekeeping.

At present these bags are palletized at the receiving point, an operation requiring about 14 manhours. A carload comprises 1,600 bags, each weighing 50 pounds. According to careful estimates, it should take us no more than two hours to unload and warehouse the same amount of material if received in palletized loads. This problem is being studied now.

At present our company is negotiating with all our suppliers of bagged material to ship in unit loads. The problem is facilitated by the fact that our material handling department is in a position to devise the most suitable type of pallet and method for each type of product, but at present the realization of this phase of the program is being slowed because suppliers are kept waiting for the necessary powered material handling equipment.

Preliminary tests, however, have already provided the essential information for proper handling. We received an experimental carload and found too much shifting of the bags in transit. This shipment was so distorted that it could not be power handled—partly the result of not binding the bags on the pallets. We have suggested to suppliers that they stack the bags in interlocking pattern on the pallets and that a corrugated vertical separator be placed between all unit loads in the car. Possibly we may also experiment with glued unit loads.

Of course, many other kinds of material are also handled in unit loads, but the foregoing examples were chosen because of the special interest connected with the problems for which solutions had to be found. *(See last month's article, page 15, on details of handling bulk pulp and innovations in yard trucking.—Ed.)* This leaves the highlights to be covered on the handling of the finished products in our new warehouse. We are now in the midst of completing this operation.

Centralized Warehousing and Shipping

Our new and enlarged warehouse facilities are designed to (a) provide needed space for our greater volume of finished goods produced by an augmented manufacturing department and (b) to centralize all our warehousing and shipping operations. The new warehouse, designed for the power handling of loads, will store about 20,000,000 pounds of finished stock. As previously indicated, the finished papers are packed in containers of many sizes and shapes. While five pallet sizes may be necessary to accommodate the various types of packages, we are naturally trying to standardize on the fewest possible number, consistent with good practice.

I want to emphasize, however, that the new warehouse project is still under the heading of "work in progress." The final touches probably won't be completed for several weeks, possibly months, from now. This will depend largely on the kind of delivery we can get on new fork trucks, tractors and trailers. It should be borne in mind, therefore, that the following description is based on our drawn up

(Turn to page 46)

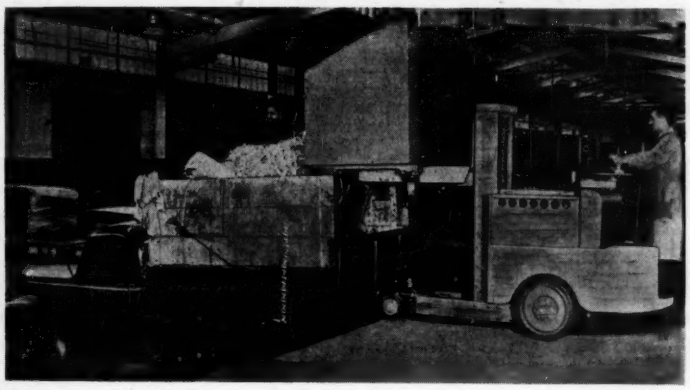
HUSKY MATERIAL HANDLER

This Diesel-electric locomotive is handling material on a large scale in the 200-acre yard area of the Hammermill Paper Co. The 65-ton, 350 H.P. locomotive is shown hauling a trainload of pulp wood from the stockpile to the wood room. The locomotive does many other tasks on the miles of track in the

company's yard. It transports cars of coal to the power stations, also spots cars of limestone and sulphur for subsequent handling by cranes. It spots all cars of incoming raw material at unloading docks, and switches empties to spurs for removal by railroad locomotives. It's a heavy-duty material handler that keeps materials flowing in the company's large yard area.—*Courtesy, Hammermill Paper Co., Erie, Pa.*

SOLVING A PAPER DISPOSAL PROBLEM

A manufacturer of waxed paper wrappings experienced a problem in disposing of large quantities of paper streamers produced by cutting knives. Large bins mounted on dollies were loaded, then pushed to the shipping platform



where the waxed "ticker tape" was transferred by hand into over-the-road trucks bound for a salvage plant.

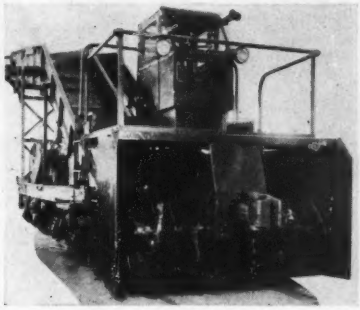
As an experiment, one of the company's powered platform trucks was assigned to this disposal operation, shown here. The loaded bin is picked up, transported by the truck to the shipping platform and then elevated to the necessary height. When the hinged front is dropped, the slippery paper slides of its own weight into the waiting vehicle. The operation is now done in a fraction of the time required formerly, and the company uses the high-lift truck and hinged-front skid bin for the operation regularly.—*Courtesy, Electric Industrial Truck Association.*

RAILROAD SNOW MELTER

A new answer to paralyzing snowfalls and drifts in railroad yards is shown in the accompanying two photos—a railroad snow melter manufactured by a company making a diverse line of material handling equipment.

Heavy snowfalls annually cause costly traffic tie-ups in railroad yards, a problem which this equipment is designed to overcome. The new machine literally eats snow. It does not throw it to one side, which would merely clear one track to clog another. Instead, this new machine scoops up the snow from the track, discharges it into a tank, and then turns it into water for easy disposal.

The snow melter consists of two separate car units—the snow loader

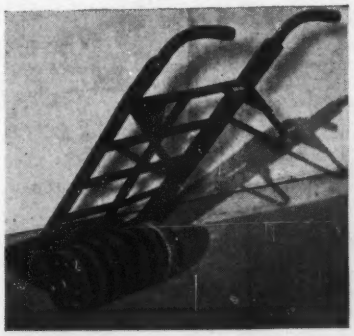


and a melting tank unit. Each unit is built integral with a 70-ton flat car and operates in conjunction with a locomotive.

The method consists of coupling the loader and tank units ahead of a freight locomotive, which furnishes motive power and steam to melt the snow. The latter is removed from the track and is carried upward by two continuous belt conveyors, then into a hopper at the top of the melting unit. The melting process is accomplished by dumping the snow directly into water heated to the boiling point by steam injection. Two tanks, one larger than the other, are on the melting unit. Steam injection nozzles cause agitation and circulation of the dissolving snow.

The water from the larger or melting tank is discharged into a convenient drain or catch basin, while the closed gate valve retains the hot water in the smaller heating tank. By the time the water has been emptied from the larger melting tank, the water in the heating tank is boiling, and the cycle starts over again. The snow melting unit of the machine was originally the idea of the Boston & Maine Railroad, but many improvements have been designed for high capacity and efficient operation in the new model shown.—*Courtesy, Barber-Greene Co.*

SEVEN-WHEEL HAND TRUCK—This specially designed rubber-tired hand truck was developed during the war for moving heavy loads within



airplane fuselages. Seven wheels were provided in order to distribute the loads and thus avoid damage to the plane framework or shell.

IN THIS SMALL ASSEMBLY OPERATION, ADJUSTABLE WORK TABLES PROVIDE . . .

The Right Angle

This company is producing huge quantities of industrial safety equipment by using correct methods in work station layout. Adjustable tables, optimum work areas, and unusual fixtures all play a part in this high and low quantity production.

By CHARLES W. PUNTON

Works Manager, Mine Safety Appliances Company, Pittsburgh, Pa.

perator assembling wires in form. Note location of bins and slanting table top.

rtical bins holding boxes ready to be packed in carton placed in slot in the table top.

erator assembling part in small jig using a o-handed layout with a bin set in the table.

OUR company has always believed that proper methods in material handling must be employed if economical output is to be maintained. Our products range in quantity from thousands per year to millions, yet we have been able to cope with unusual designs, varying quantities, and rigid quality requirements by using flow principles wherever possible.

The building which houses our various production activities is a four-story brick and concrete structure. The first floor is devoted to receiving, shipping, and general machine shop departments. Two locations have been set aside for storage of material used in production; one on the first floor and an overflow section on the second floor.

The first floor storage is maintained in shelves, and if there is extra material to be stored it is fed to the second floor on a fabric conveyor belt, cleated to prevent the cartons or boxes from slipping. Materials such as gauze or muslin, which arrive in rolls, are loaded on skids and taken to the respective department by hand truck or platform lift truck. The type of conveyance used depends upon the aisle width of the sections.

Unit Work-Station Principle

We manufacture many different types of safety equipment used in industry, and through the development of each of these to the final finished product, work stations were analyzed to determine the proper handling required. This is particularly important where a product may be manufactured one month and removed from production the next, only to have it back in the shop some months hence. Although operation analysis sheets might record the sequence and duration of manufacturing and assembly operations, the actual work station setup is lacking.

It is true that pictures can and do record valuable information for manufacturing and layout purposes, but to expect a picture to give exactly the same setup each time is bordering on the impossible.

With these thoughts in mind, a work table was developed with several important features requested to be embodied in its design. First, the height of the working surface from the floor was to be adjustable to allow for differences in stature of the operators using it. Second, the top was to be adjustable to any angle from horizontal to 20 degrees. Third, and probably the most important, the top had to be removable merely by lifting it from a quadangular frame which held it in place. This latter feature would permit easy storage should there

be any possibility of repeat orders for a specific item.

The Proof of the Pudding

We found many uses for that special work table, all of which were evolved through practical methods. For example, during the last war, we had a difficult part to manufacture which was composed of several units requiring special wiring. Naturally, a diagram was provided to aid in securing the desired number of loops and splices, but to obtain the uniformity and quality required would have necessitated multiplying the supervisory force many times.

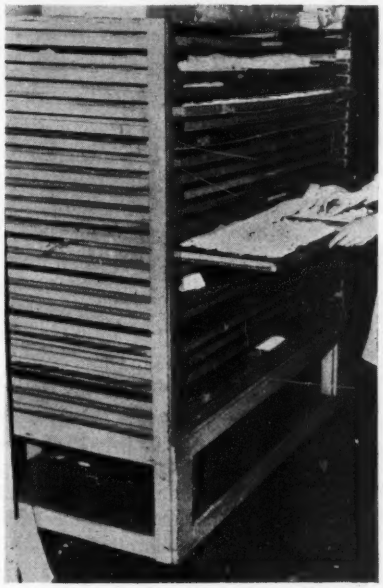
As shown in one of the photos, our special work table was set up for a two-handed assembly. The wiring diagram required was laid out on a small board, and pegs were inserted to allow the wires to be threaded between them. The bins containing the sections of wire were placed at optimum working distance from the operator, and secured permanently to the top of the table. When the monthly production of this item was completed, the top of the table was removed and stored until needed.

Slotted racks were designed to hold each unit which permitted the table tops to be slid horizontally into them. Several setups can be stored, one over the other, in these racks so the area required is not excessive.

The many types of processing, assembly, and packing operations which are a daily routine in our plant, prove the versatility of this work-table and unit-layout system. Changes in layout of a department using this system can be made in a short time and different arrangements within a specific layout can be made merely by rearranging the tops of the tables.

The height adjustment is also noteworthy. Since no two operators are exactly alike in stature, a small handle was placed a short distance from the operator's right hand, which permits the table to be raised or lowered to the desired height. An adjustment in the rear allows the top to be slanted conveniently up to 20 degrees from the horizontal.

Boxes arriving in sectional dispatching room to be loaded into cartons. Note caster type trucks.



Caster-mounted shelf truck used for handling gauze parts between work stations.

Carton handling on wheel conveyor in dispatching section. See wire strapping located below conveyor, and convenient chute entrance at end.

Bins, Fixtures, and Work-Station Layout

Certain operations require a constant supply of material, and bins located at proper working distance provide excellent temporary storage media. The cartoning operation shown in one of the photos illustrates the use of such bins. The material is loaded in the open top and flows by gravity out the bottom, which has an inclined surface to feed the cartons toward the operator.

The top of the table in this instance has been slotted to the carton size, which retains the container and permits two-handed loading.

Assembly fixtures of all types are used to hold the work leaving the

operator free to use both hands, which is one of the easiest ways to achieve a rhythmical sequence of motions. It might be of interest to note also the semi-circular arrangement which is used in placing the bins and trays at the work-station. Accepted motion-range data determined the arcs through which the operator's hands moved for many different assembly operations. These arcs are used in locating the bins or trays for optimum operating efficiency.

"Below the Surface" Bins

Quite often when two or more pieces are being assembled, it is highly desirable to place the supply of one of the parts directly in front of the operator. Since this type of operation runs smoother when an unimpeded plane can be utilized, we set the bin in the table rather than on it. This principle is used, however, only when the parts are immediately in front of the assembler. The farther away the supply of material is placed the more the angle to be maintained with reference to the top of the table.

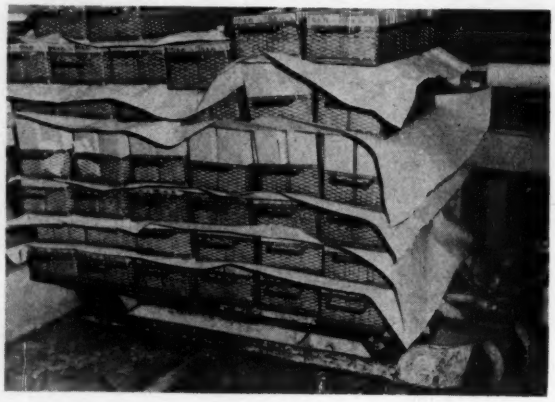
This principle is illustrated in two of the accompanying photos. One shows a swab assembly, the other, ear protectors.

Special Hand Truck and Pallets

I have mentioned how the raw materials are transported to the various departments via hand truck or platform lift truck. When they arrive they are placed almost immediately into production (there may be a very short temporary storage period should the work station be filled). As an illustration let us consider the flow of gauze swabs.

The gauze arrives in large rolls which are cut into strips and folded on long tables. Subsequent processing forms the small units which are to be assembled into the plastic containers. When this assembly is completed, the swabs are sterilized. Handling millions of these small parts yearly resulted in the development of a simple but useful pallet. Holes drilled at intervals in a 12-inch-square board holds the swabs upright until they are ready for packaging. These pallets can be tiered, one over the other, in a four-wheel truck used between assembly, sterilizing, and packaging.

Once the swabs are packaged, they are placed on another special four-castered truck for removal to the shipping room. This truck, shown in one of the photos, has removable shelves which gives four different combinations of space allocation. The handles are set at a 45-degree angle which permits easy grasping and non-interference with loads on the top shelf. This cart can be pushed into areas where, because of space limitations, other types would be prohibited. Being constructed of plywood sides with light under-members, it is easy to handle and still furnishes enough rigidity for the weights carried.



Moving load of bandages in wire baskets by hand lift truck to autoclave for sterilizing.

Chute Delivery

As I mentioned before, our plant has four stories with manufacturing on each floor. To adequately handle finished products from packaging to shipping on the first floor, a spiral chute was installed which services each floor on its way down to the shipping area.

Entrance to the chute is through a slanting plate from a section of wheel conveyor. Shown in one of the photos is a typical packaging section on one of the floors. This is also a dispatching station where the shipping paper work is done before the items are released for shipment. The chute entrance is shown at the end of the wheel conveyor line to the left of the picture.

The work-station layout here, too, is planned to permit the packer to select cartons for loading of smaller boxes from a handy secple, the swabs we were talking about can be crushed without very much pressure; in fact that is the method used to saturate the gauze with the antiseptic solution contained in each one. These facts had to be taken into consideration when the chute exit was planned on the first floor.

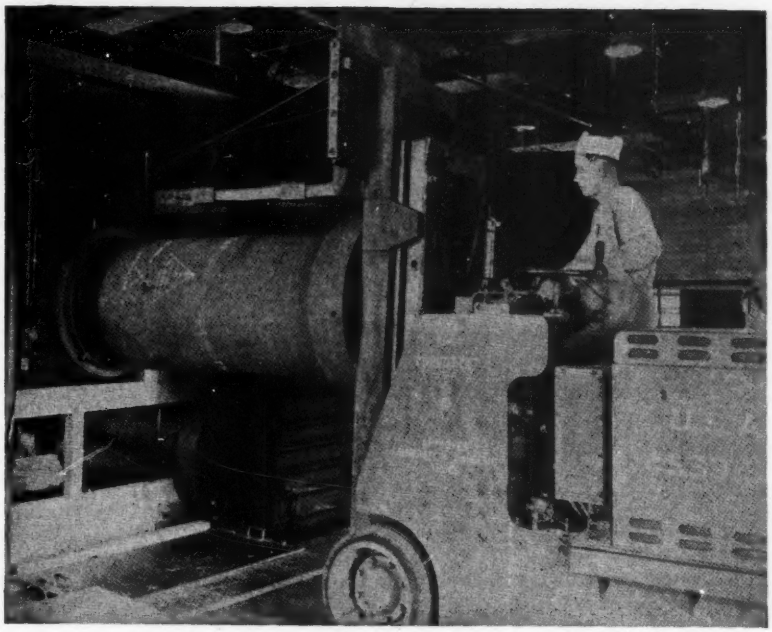
To break the speed of the cartons as they emerge from the chute, a powered belt was installed followed by a section of gravity rollers, another chute, and finally another belt. This may seem rather involved, but the cartons actually are brought from ceiling height (about 15 feet) to the floor working level in less than 50 feet of horizontal travel.

Providing the Proper Tools

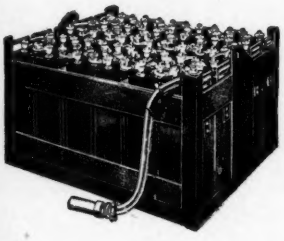
We have two major types of shipments from our plant. One is parcel post, the other is by highway truck or rail. All the cartons are handled on the conveyor system just described, so some separation must be made. This was accomplished by extending two lines of conveyor at right angles from the main delivery conveyor system.

We at Mine Safety believe in thoroughly analyzing the handling problem at hand, and then supplying the necessary equipment to do the job. Whether it is a multiple work-station setup or interplant transportation, we have tried to use standard equipment, or if necessary develop special devices to suit the needs. In this way economical high and low production alike can be maintained.

Use Battery Trucks for SAFE handling



Battery operated fork truck loading car at ordnance depot



...Alkaline Batteries for Most Dependable Power

One of the outstanding advantages of battery industrial trucks for material handling is their inherent safety. Because they give off no fumes and are practically free from fire hazards, they can be used without restriction in almost any kind of plant. They can even be provided with spark-enclosed construction for safe operation in hazardous locations. Many are operating successfully in ordnance depots.

With batteries exchanged two or three times per 24-hour day, the truck is kept continuously supplied with power. While one battery operates the truck, another is being charged. Except for the few minutes needed to change batteries, the truck need not stop for servicing its power unit. Its electric motor drives have a minimum of wearing parts; are inherently simple and trouble-free. The truck starts instantly; accelerates smoothly; operates quietly; consumes no power during stops. Not only does it make efficient use of power but the current used for battery charging is the lowest-cost power available.

Thus the battery truck is an inherently dependable, safe and economical handling unit, especially when powered by Edison Alkaline Batteries. With steel cell construction, a solution that is a natural preservative of steel and a fool-proof principle of operation, they are the most durable, longest-lived and most trouble-free of all batteries. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Company, Limited, Montreal and Toronto.

Edison

ALKALINE BATTERIES

Tools that Ac

The Joslyn Manufacturing
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President Marcellus L. Joslyn
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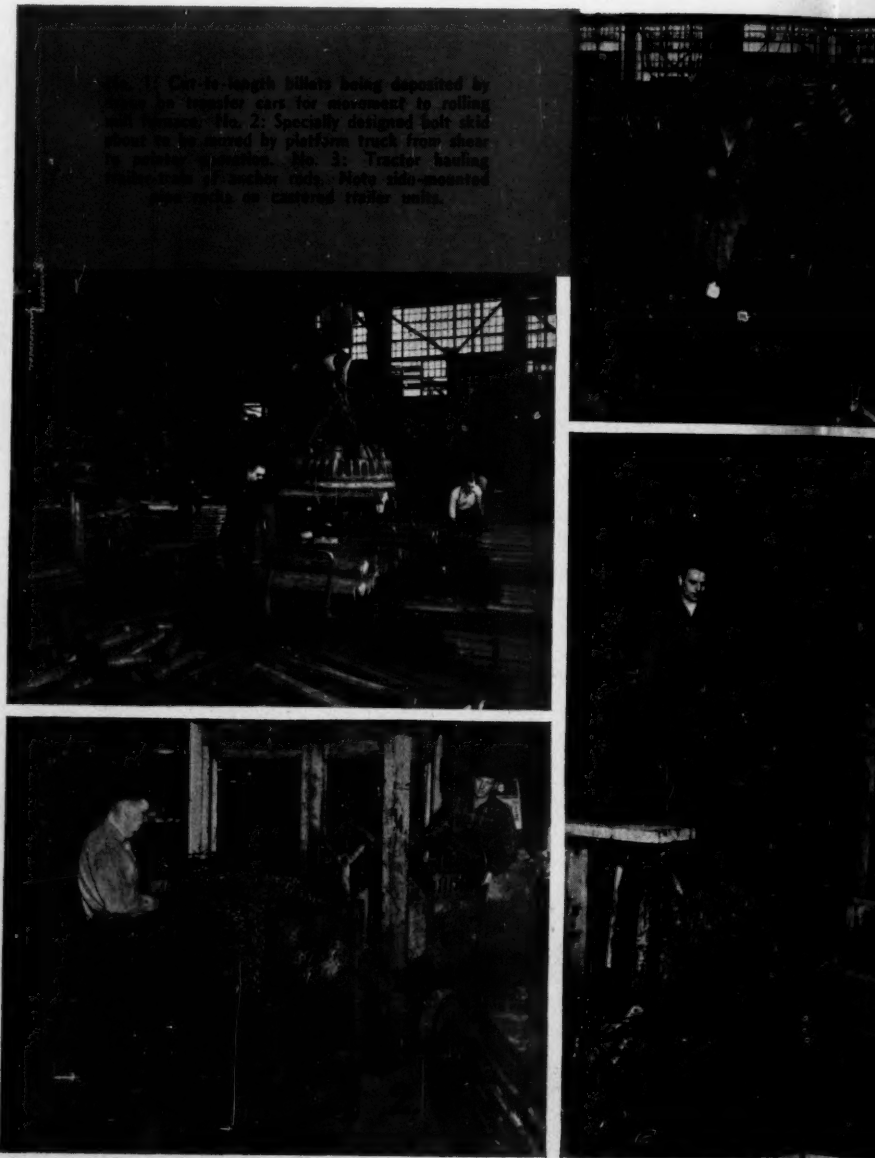
Raw, in-process and finished materials move in quantity—whether heavy lifts of steel or small bolts—between receiving, storage, processing, finishing, assembly and shipping operations. Every type of equipment is designed for the product handled. As a result, there is no unnecessary muscle work, no backtracking or rehandling in this plant.

By BURT M. SMALLEY
Vice-President
The Joslyn Manufacturing and Supply Co.,
Chicago, Illinois



OUR company manufactures pole line hardware for use by power and light companies in the distribution of electricity. A large proportion of the items is manufactured in the company's parent factory in Chicago, whose handling operations are the subject of this article. This plant includes, besides service and warehouse facilities, a rolling mill, forge shop, extensive machine and punch press shops, as well as finishing, assembly, packing and shipping departments. The products made (and carried in our catalogs) cover 8,000 items, including various diameters and lengths. Among these are bolts, brackets, braces, anchor rods, street lights, lightning arresters, wood strain insulators, and many others.

Adjacent to the machine shop on the southeast end of the plant is the rolling mill, where the steel is rolled that is used in the manufacture of certain types of pole line hardware.

Flexible Overhead Handling

The steel storage area is at the south end of the plant, adjacent to the rolling mill. Billets and other stock arrive by freight car under the spans of a 10-ton crane and a 5-ton crane, each operating in one of two adjoining bays. The larger crane uses chain slings and lifting magnets for unloading purposes,

XUM

Aid Incentives

Manufacturing Company is well and for its profit-sharing plan, on which een written since it was pioneered by ellus L. Joslyn back in 1919. Writers nd business subjects have repeatedly tstanding production performance of as tangible evidence of the plan's ef- is article, however, wants to suggest , a contributing factor, for Joslyn tent high output per manhour. This cient material handling system. Thus, ring provides the incentive, this arti- e handling facilities are the tools that topnotch production performance.

depending on the nature of the material. The bay covered by this crane has vertical racks for storing long bar stock; billets are stacked in a nearby area. This crane unloads and stacks the incoming steel. Using a lifting magnet, it also loads scrap into freight cars. It also moves the raw material from this bay to the processing operations.

Long bar stock or billets to be sheared or cut to length, for example, are deposited by it at the cutters, or shears, both located conveniently in the same department. The crane then picks up the cut-to-length billets (see photo) and deposits them on flat-top, flanged-wheel trucks operating on a 24-inch gauge track that leads to the rolling mill furnace. The maximum length of the haul is approximately 75 feet. Since this track is slightly inclined, gravity facilitates the movement of the heavy loads, which weigh about 10,000 pounds. A weighing scale is installed along this track.

As mentioned previously, the second bay in this area is covered by a 5-ton transfer crane, which handles coils, round bars and flat stock which do not require rolling. Since a railroad spur runs through both bays, loading and unloading by either crane can proceed at the same time. By use of a hairpin hook the 5-ton crane unloads five to six coils at a time. A J-shaped hook is used for removing the individual coils when needed for production. A long spreader beam with S-hooks is used for handling flat stock 20 to 30 feet long, and a shorter beam is available for moving the shorter lengths.

The bridge of this 5-ton transfer crane can be lined up with a monorail in the adjacent machine shop, where another 5-ton crane serves a number of shears and presses. This arrangement permits the crane in the storage bay to deliver loads inside the shop (by passing through a swinging door installed in the wall, and also permits the monorail crane in the shop to bring in material from the storage area, traveling on the bridge of the "outside" crane. This flexibility assures that ample materials will be available when and where needed. In

this manner the material is brought into the main machine shop from the west end of the storage area. However, it also enters another part of the shop from the east end of the storage area. This is chiefly the stock rolled in the mill.

Quantity Handling of Small Items

The cut-to-length stock from the rolling mill is deposited on flanged-wheel rack-type trucks on which the lifts are prepared. This steel may be moved and stacked by crane into the finished stock storage area for shipment (part of the rolled steel is shipped out); or it may be lifted across the track into the main steel storage area for future fabricating purposes in our own plant. The steel handled at this point is mainly small-diameter bar and coil stock which is fed directly (through a wall opening) into the shears. These cut the stock to bolt-lengths of various sizes.

In disposing of the individual pieces from the shears, certain factors had to be considered, among them: movement in quantity, easy accessibility and handling of the pieces at the next machining operation, and proper working height. To accomplish this, a special bolt skid was designed which is shown in one of the photos. It is made of an angle iron frame and flat bracings with a welded plate for a bed. The unit has an underclearance of 13½ inches, which permits it to be moved by platform lift truck (to the pointer and subsequent operations).

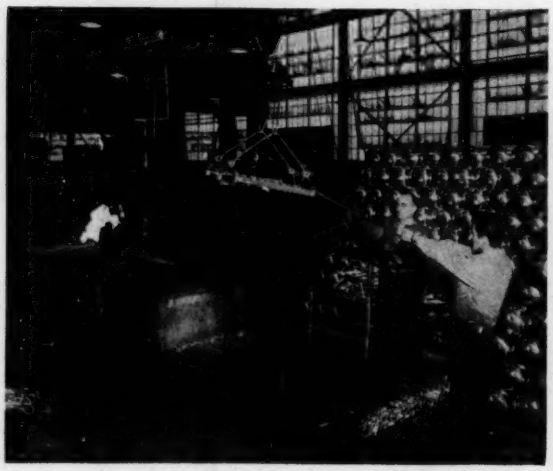
These bolt skids are designed in two widths, to accommodate without loss of load capacity the pieces of various lengths. The narrower skid (18 inches wide) accommodates a single row of the standard length pieces across its width; the wider skid (24 inches wide) is used for the shorter ones, which can be placed in two layers on the wider bed. This size skid is also suitable for the longer bolts that we run from time to time.

In this way we are enabled to move the numerous small pieces in considerable quantity between the various operations. Since the skids are of waist height, they can be conveniently loaded and unloaded without stooping; and the even horizontal layers permit the quick and easy removal at subsequent machining operations. The pieces are thus handled to and from these skids at the various work stations, until a later operation indicates the advisability of a different container adapted for efficient handling in another department. This is illustrated in later paragraphs.

Movement in quantity and avoidance of rehandling are similarly observed in the main machine shop served by the 5-ton monorail crane. Depending on the size and shape of the items, the sheared and pressed pieces are handled by use of skid bins, flat steel skids, 4-wheel trailers coupled into tractor trains, or special receptacles if required by the nature of the product. In short, in the planning of every production step the handling and movement of the material are considered as an integral part of the over-all operation. In this way workers are not burdened with unnecessary handling tasks, and rapid movement of the material assures "enough work ahead" at all machines.

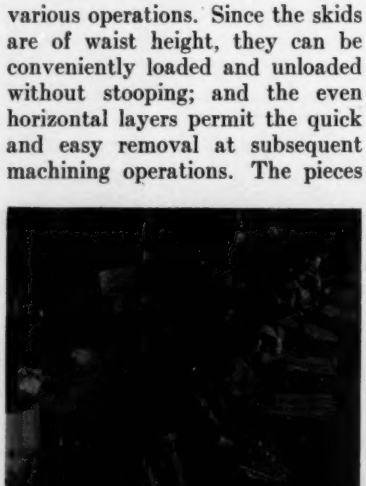
Among the smaller items produced are cold-headed bolts (which are up to six inches in length). The bolts are deposited into steel drums, equipped with trunnions. These containers are conveniently moved by means of the notched supporting arms on the drum trucks shown in one of the photos. Incidentally, two-wheel trucks of this type recently added to our fleet are equipped with rubber-tired wheels. This selection was made in order to ease the work for

(Turn to page 48)



Galvanized rods being lifted from rinse tank by one of four three-ton hoists operating in area.

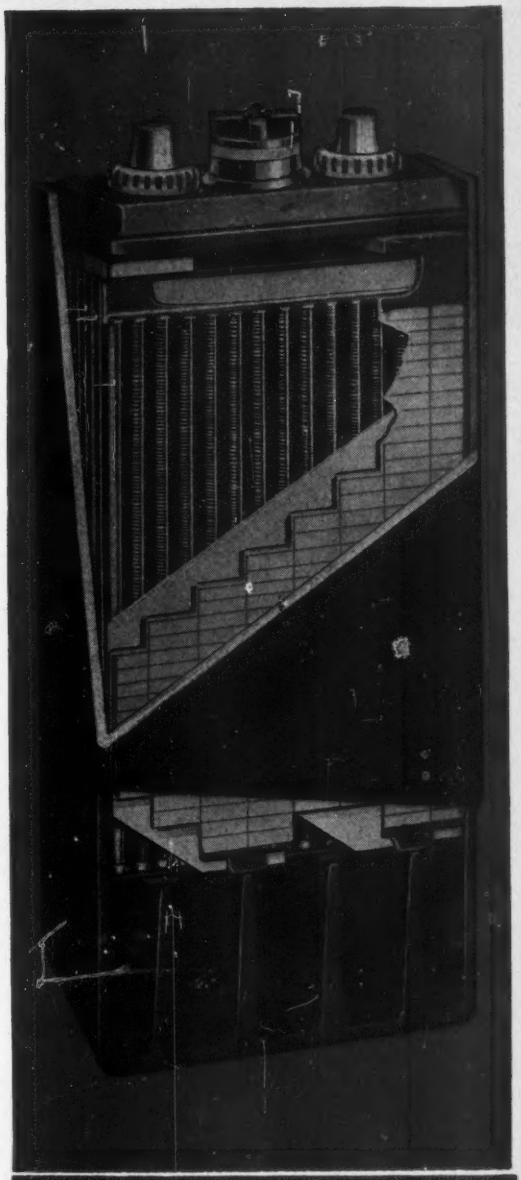
Skid loads of in-process material are stored at an angle, requiring minimum maneuvering by truck.



Work is supplied to assemblers from right side of table, then removed by packers at left side.

Exide

IRONCLAD BATTERIES



BUILT FOR PEAK PERFORMANCE AND LONG LIFE IN HEAVY-DUTY SERVICE...

The Exide-Ironclad is a different type of battery . . . in design, construction, service qualities. It was developed to meet the need for a battery to deliver high, sustained power in heavy-duty service over a long period of time.

THE POSITIVE PLATE is unique in battery design. It consists of a series of slotted, vertical, hollow tubes which contain the active material (See illustration at left). The slots in the tubes are so fine that, while they permit easy access to the electrolyte, they prevent the lead oxide from readily washing out, thus adding considerably to the life of the plate.

THE NEGATIVE PLATE has been designed and is built to equal the increased life of the positive plate. Like the positive plate, it has two feet at the bottom to raise it above the two supporting ribs.

SEPARATORS are made of Exide Mipor, a special rubber composition, and will match the long life of Exide-Ironclad plates. The cutaway illustration shows how separators rest on ribs well below bottom of plates, thus making probability of internal short circuits very remote.

THE EXIDE-IRONCLAD ASSEMBLY is sealed in jars of Giant Compound. Jars are practically unbreakable in normal service.

THE RESULT is an efficient, ruggedly built battery that assures dependable performance, long life and maximum economy . . . a battery that fully measures up to each service requirement . . .

★ ***HIGH POWER ABILITY*** . . . needed in frequent "stop and go" service.

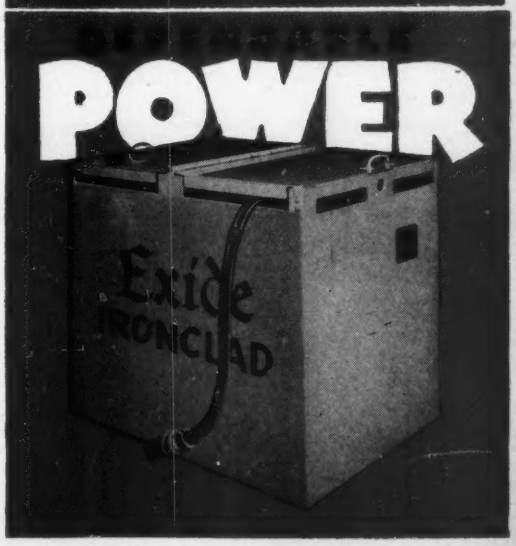
★ ***HIGH MAINTAINED VOLTAGE*** throughout discharge.

★ ***HIGH ELECTRICAL EFFICIENCY*** that keeps operating costs low.

★ ***RUGGED CONSTRUCTION*** . . . for long life.

Exide-Ironclads are supplied in sizes to suit every make and type of electric industrial truck.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto



this manner the material is brought into the main machine shop from the west end of the storage area. However, it also enters another part of the shop from the east end of the storage area. This is chiefly the stock rolled in the mill.

Quantity Handling of Small Items

The cut-to-length stock from the rolling mill is deposited on flanged-wheel rack-type trucks on which the lifts are prepared. This steel may be moved and stacked by crane into the finished stock storage area for shipment (part of the rolled steel is shipped out); or it may be lifted across the track into the main steel storage area for future fabricating purposes in our own plant. The steel handled at this point is mainly small-diameter bar and coil stock which is fed directly (through a wall opening) into the shears. These cut the stock to bolt-lengths of various sizes.

In disposing of the individual pieces from the shears, certain factors had to be considered, among them: movement in quantity, easy accessibility and handling of the pieces at the next machining operation, and proper working height. To accomplish this, a special bolt skid was designed which is shown in one of the photos. It is made of an angle iron frame and flat bracings with a welded plate for a bed. The unit has an underclearance of 13½ inches, which permits it to be moved by platform lift truck (to the pointer and subsequent operations).

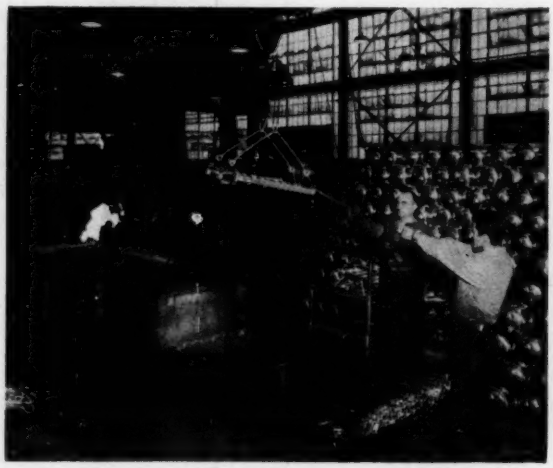
These bolt skids are designed in two widths, to accommodate without loss of load capacity the pieces of various lengths. The narrower skid (18 inches wide) accommodates a single row of the standard length pieces across its width; the wider skid (24 inches wide) is used for the shorter ones, which can be placed in two layers on the wider bed. This size skid is also suitable for the longer bolts that we run from time to time.

In this way we are enabled to move the numerous small pieces in considerable quantity between the various operations. Since the skids are of waist height, they can be conveniently loaded and unloaded without stooping; and the even horizontal layers permit the quick and easy removal at subsequent machining operations. The pieces are thus handled to and from these skids at the various work stations, until a later operation indicates the advisability of a different container adapted for efficient handling in another department. This is illustrated in later paragraphs.

Movement in quantity and avoidance of rehandling are similarly observed in the main machine shop served by the 5-ton monorail crane. Depending on the size and shape of the items, the sheared and pressed pieces are handled by use of skid bins, flat steel skids, 4-wheel trailers coupled into tractor trains, or special receptacles if required by the nature of the product. In short, in the planning of every production step the handling and movement of the material are considered as an integral part of the over-all operation. In this way workers are not burdened with unnecessary handling tasks, and rapid movement of the material assures "enough work ahead" at all machines.

Among the smaller items produced are cold-headed bolts (which are up to six inches in length). The bolts are deposited into steel drums, equipped with trunnions. These containers are conveniently moved by means of the notched supporting arms on the drum trucks shown in one of the photos. Incidentally, two-wheel trucks of this type recently added to our fleet are equipped with rubber-tired wheels. This selection was made in order to ease the work for

(Turn to page 48)



Galvanized rods being lifted from rinse tank by one of four three-ton hoists operating in area.

Skid loads of in-process material are stored at an angle, requiring minimum maneuvering by truck.

Work is supplied to assemblers from right side of table, then removed by packers at left side.

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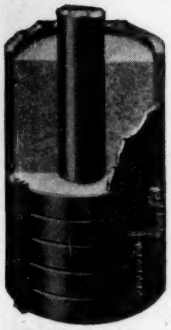
THE POSITIVE PLATE is unique in battery design. It consists of a series of slotted, vertical, hollow tubes which contain the active material (See illustration at left). The slots in the tubes are so fine that, while they permit easy access to the electrolyte, they prevent the lead oxide from readily washing out, thus adding considerably to the life of the plate.



THE NEGATIVE PLATE has been designed and is built to equal the increased life of the positive plate. Like the positive plate, it has two feet at the bottom to raise it above the two supporting ribs.

SEPARATORS are made of Exide Mipor, a special rubber composition, and will match the long life of Exide-Ironclad plates. The cutaway illustration shows how separators rest on ribs well below bottom of plates, thus making probability of internal short circuits very remote.

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★ ***HIGH POWER ABILITY*** . . . needed in frequent "stop and go" service.

★ ***HIGH MAINTAINED VOLTAGE*** throughout discharge.

★ ***HIGH ELECTRICAL EFFICIENCY*** that keeps operating costs low.

★ ***RUGGED CONSTRUCTION*** . . . for long life.

Exide-Ironclads are supplied in sizes to suit every make and type of electric industrial truck.

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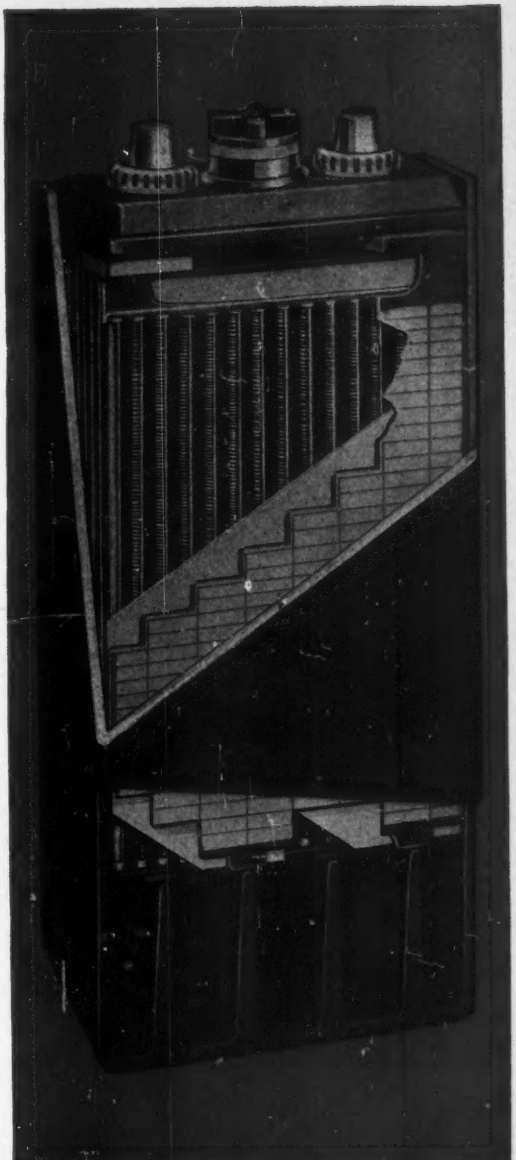
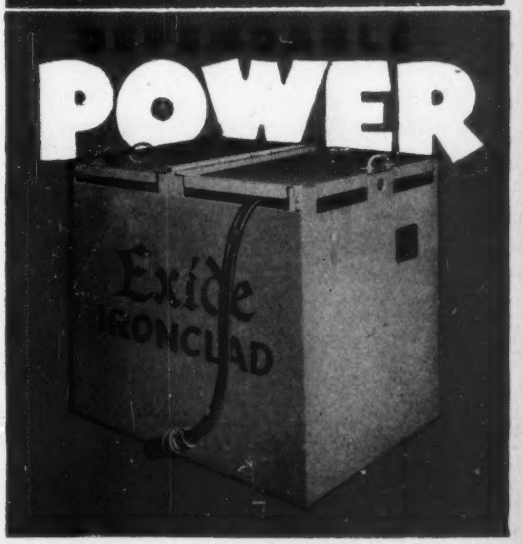
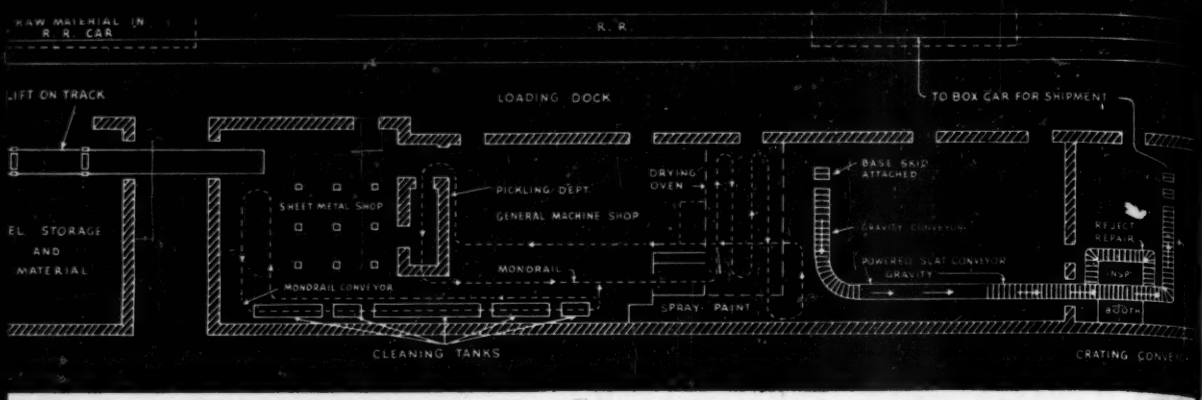






Flow diagram shows washing machine production line from receiving through shipping.

A FINE LINE

By K. J. CRIDER
Factory Manager
Appliance Mfg. Co.
Alliance, Ohio

This Company makes economical use of space in the mass production of washing machines. Efficient devices facilitate numerous handling and positioning tasks—through receiving, assembly, and shipping.

WHEN the manufacturing and assembly line for our washing machine was laid out, we endeavored to hold to a straight line system as nearly as possible. The railroad spur which extends along one side of the plant was to be the "beginning and the end" of the line, so the layout inside had to correspond with this arrangement. The general machine shop and sheet metal fabricating sections had already been set up, and hence the line was placed on the opposite side in the building as shown in the flow diagram.

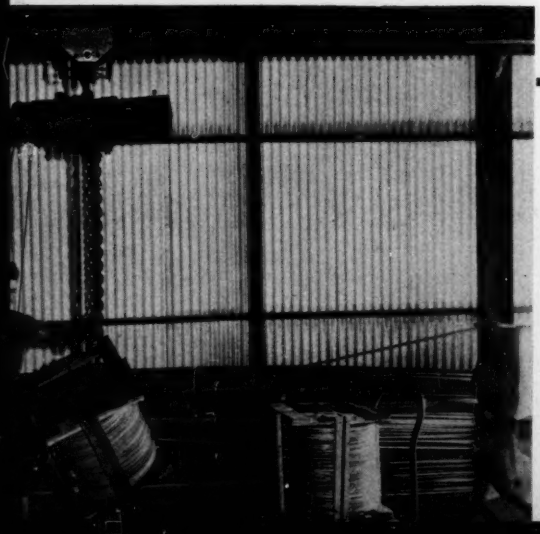
Receiving and Prefabricating

The sheet metal storage building is located next to the railroad, affording direct unloading facilities. A box hoist mounted on overhead trolley rails is used to remove the steel in various forms from the gondolas or flat cars. Sheets are received in sizes sheared to give maximum finished units and minimum scrap. They are also bound into bundles, which facilitates their handling. Several bundles are stacked on a skid, which is removed by a hand lift truck to storage.

When it is necessary to route the stored material to the line for processing, this same truck-and-hoist combination is used to move the steel into the sheet metal department in the adjoining building. (See the flow diagram.)

The layout is rather interesting here, because parts are moved from machine to machine by hand, and the arrangement of these sheet metal machines was designed to pass the parts from one operation to the next in uninterrupted flow. Angle iron extensions have been welded to each machine to permit resting the parts while feeding them through the operations.

These consist of shearing and forming the parts to finish sizes prior to cleaning them. In this department, the fabricated steel washing machine chassis and parts are hung on a monorail overhead conveyor which carries them through a series of washing tanks.



Coiled stock being placed on hand truck, from storage, using trolley-mounted electric hoist, left.

Fabricated parts are hung on conveyor to cleaning tanks. Note special holding hooks, below.

To use this conveyor for variously shaped pieces, a specially designed adapter hook is used which permits any of the parts to be attached securely. This hook is made economically from standard steel rod. (See photos.) The conveyor track is inclined in such a way as to permit the parts to be completely submerged in each tank and to be withdrawn after each wash. A 7-foot ogee radius is used into and out of the tanks, later returning to 11-foot, 9-inch centers from the rail to the floor.

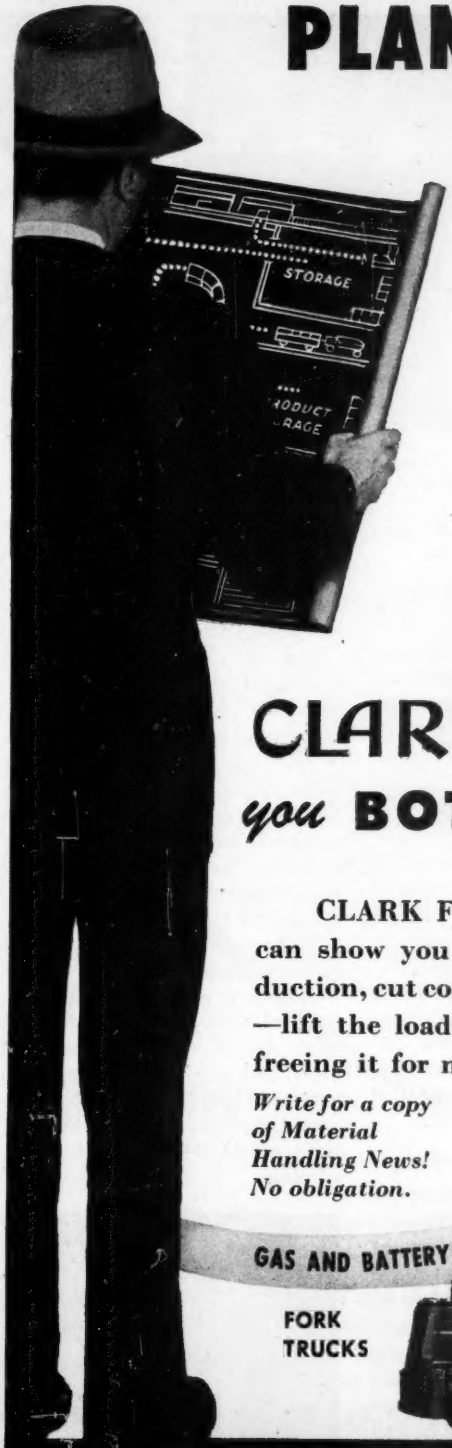
Dual Purpose Pickling Conveyor

Zinc parts are pickled before they are painted and finally assembled in the unit. Space requirements were limited, so we placed this station at right angles to the main line (see flow diagram) between the sheet metal shop and the general machine shop. The conveyor carries the zinc parts to the pickling tanks, and then to the painting station. The layout is arranged to carry all the washing machine parts to be painted on this conveyor.

Alternate spacing of zinc parts permits empty hooks to be loaded with steel parts that have just been washed in the straight line tanks. The steel parts are hung on the adapter hooks and fed to the paint booth, spaced between the zinc items.

The washing machines are painted while they pass through the paint booth on their way to the baking oven. Operators rotate the assembly as it hangs from swivel hooks on the powered monorail system. Water fall drops to the rear absorb most of the dispersion.

Before painting, an interesting handling setup is used. A special table was made to hold the units at proper working height while the motors are being added. In the center of this table, four compartments hold screws, nuts, bolts, etc., as shown in one of the photos. The locating fixture is suspended above the work table, and is brought to position for assembly by the operator pulling downward on the unit. A few screws are removed from the bins in the center of the table and positioned on the table top. As soon as the assembly is completed, the fixture is released and the washing machine base is hung on



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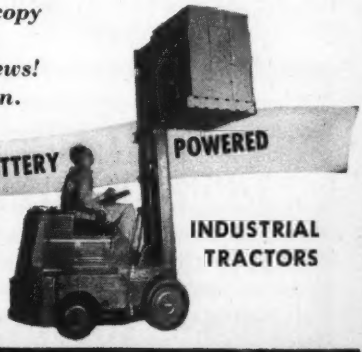

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Motor assembly table and locating fixture setup. Note five-holed carriers on conveyor.

Bolting washer base to frame on turntable. Note small parts carried on truck at right.

the monorail conveyor to proceed to the spray painting section.

Positioning for More Space

As the units leave the spray paint booth, they are carried up into the overhead baking oven without being removed from the monorail system. Since this oven is a large installation, we placed it at right angles to the main line, also to the zinc pickling tanks. Again it was a case of using space between departments which was not as vital to those sections as the longitudinal area in the main flow.

After following a circuitous route through the baking oven, the line dips to floor-handling height, emerging about 20 feet from where it entered. Three times this distance would have been absorbed in the straight line had we installed the oven in any other position.

Gravity Turntables Eliminate Fatigue

When the baking operations are completed, the final assembly, inspection, and packing of the unit follow in that sequence. The various parts are removed from the system and are handled in one of two ways. The smaller parts are temporarily stored on four-wheel trucks, while the washing machine bases are placed directly on wooden frames (see photos) which later become the bottom of the shipping crate. The frames are stored next to gravity roller sections with just enough space to permit an operator in one turn to remove one and place it on the gravity turntable.

These turntables have proven their worth to us, because of the ease with which the washer can be positioned for four-cornered assembly. An operator can stand in one position and bolt all the legs to the frame without walking around the machine. These turntables have minimum clearance between the disjointed portions to allow turning and also sliding the unit to the succeeding set of rollers. When the assembly has advanced to the positions where the smaller enamelled units are added, these parts are removed from the four-wheel trucks stationed next to the line. The trucks are returned for reloading at the exit of the baking oven.

To keep the final assembly of the washing machine progressive, a section of powered slat conveyor was inserted in the main flow to feed the units slowly by while the assemblers add the wringer and other parts. When the units leave this area, they return to the gravity sections, which carry them to final inspection.

We placed the inspection booth directly in line with the main flow as the washers are completely assembled. As most layout engineers know, the handling of material through inspection with the resulting rejects (however small) can be a real bottleneck if proper layout is not provided. To accommodate any rejects, a shunt line of gravity rollers carries the washers from the inspection station to a "dead" zone for repair. After repairing, the units go to packing.

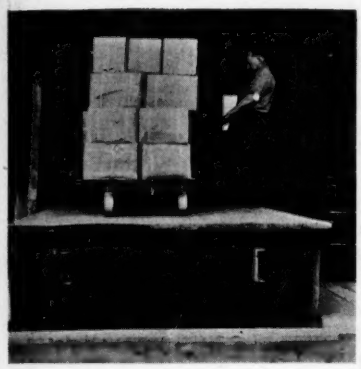
Preassembled Crates Speed Packing

The washing machines are now packed into pre-assembled wire-bound crates, which are stacked adjacent to the gravity system. An operator selects the four-sided assembly from the stack and places it around the washer, nailing it to the frame upon which the machine rests. You will note in one of the photos that the paper-wrapped

Placing pre-assembled crate around washer. Arrow indicates turntable section.

wringer is laid below the washer to conserve space. This eliminates the need for a larger crate and permits more crates to be loaded per box car.

After nailing the lid fast, an operator slides the loaded crate onto a two-wheel hand truck; from here it is rolled to the box car. A turntable gravity section is also used in this packing line to rotate the washer during the nailing of the crate. The packer remains at one position, while the unit is turned after each side of the crate is nailed at the bottom.

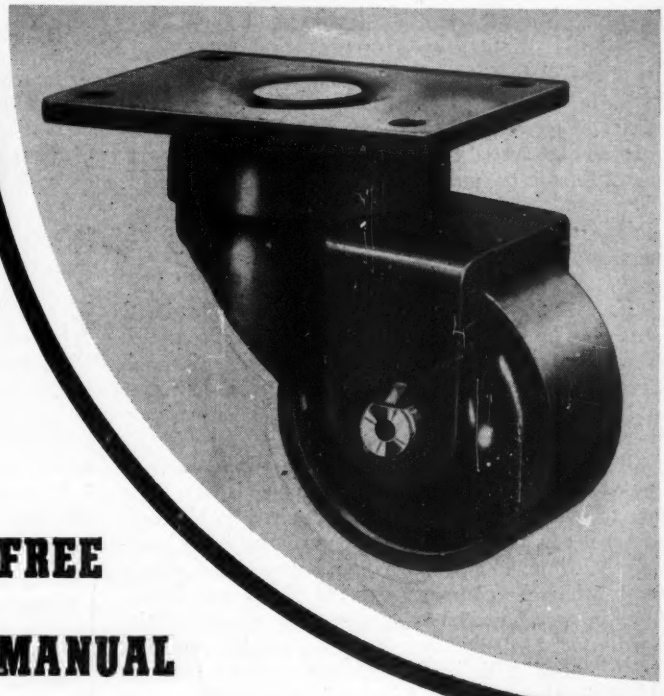


Adjustable loading and unloading platform operated by a hydraulic cylinder from below.

Numerous methods to adjust the height of loading and unloading docks have been used, and our hydraulic lifting platform has proved itself very valuable in this respect. Immediately outside the shipping department entrance, we sectioned a portion of the loading dock to be used as a height adjusting device for loading and unloading from trucks. Heavy channels and beams form the super structure, and a 12-inch hydraulic cylinder hoists the platform. The controls are located just inside the building, providing easy access from within and outside. Varying truck heights are no longer a problem for the material handlers, as any vertical increment can be obtained with the push-button control.

We believe that our ability to return to peacetime production in a relatively short time can be attributed to the economical utilization of manufacturing space and an uninterrupted flow resulting from a straight line layout. And both are aided by specific handling devices, each designed to facilitate a particular task within the line.

THE OHIO EQUIPMENT Company, Inc., Cleveland, announces the opening of an office in Akron, Ohio, to be managed by E. J. Werner. Werner was connected for the past 20 years with The Firestone Tire & Rubber Company in an engineering capacity. By training and experience he is well equipped to counsel on material handling problems. The Ohio, Equipment Co., Inc., represents such manufacturers as Yale & Towne Mfg. Co., Economy Engineering Co., Powell Pressed Steel Co., Thomas Truck & Caster Co., Harry J. Ferguson Co., and B. H. Bunn Company. The new office is designed to give better service to the Ohio Equipment Company's customers in Akron, Canton and surrounding cities.



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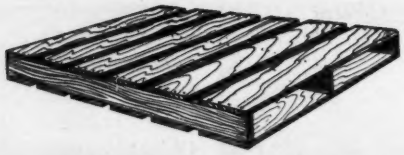
ON THE  PALLET

NEWS · VIEWS · TRENDS

THE distribution functions are the responsibility of the traffic manager, and both have not yet attained their proper place in the modern business organization. This was the contention of Albert B. Drake, president of Drake, Stevenson, Sheahan, Barclay, Inc., New York City, the nation's first consultant firm on distribution and material handling.

Drake made this statement before the April meeting of the Alumni Association of the Traffic Managers Institute. He reaffirmed his conviction that all phases of physical distribution, including some functions now entrusted to the production or sales department, should be placed under the traffic manager. The latter's position, Drake stated, should be on an equivalent level with the sales manager, advertising manager, production manager and other top executives.

"Unless this is done," the speaker warned, "I hardly see how it is going to be possible to accomplish efficient, economical distribution. While there is much talk about the general high cost of distribution, most companies do not actually realize how high their own distribution costs are.

"Firms can gain the most from warehousing," Drake continued, "if the traffic manager is in a position to select the warehouses best suited to his company's needs. He should follow up by outlining intelligently, from an operational and procedural standpoint, what the company expects of the warehouse. And the warehouse should operate as a part of the distributor's organization. But this can happen only if top management is properly aware of the function of distribution and warehousing in business."

THE Filter Paper Co. of Chicago, manufacturers and distributors of Filco tanks, filters, conveyors and filter media, was scheduled to move to its new and larger quarters on June 1. The larger space in the new building, additional personnel, as well as modernized and enlarged manufacturing facilities, are designed to give the industry better and faster service, stated General Manager Charles Miller.

IF THE demands for materials of another war equal those of the recent one, the principal iron ore reserves of our country would be almost completely exhausted. Reserves of many of our non-ferrous metals are now so low that either now or in the immediate future we shall have to look elsewhere for adequate supplies for our present needs. . . . There is increasing unanimity of opinion as to the wisdom of conserving many of our mineral resources for any future national emergency by beginning, right now, the importation of our requirements in raw materials. If such a farsighted policy were generally adopted, the payment of these imports would greatly increase the supply of dollars in foreign countries, thus permitting them to buy our exports.—*Henry D. Rolph, Director of Export Sales, The Yale & Towne Mfg. Co.*

AN INCREASE of 31.9% in freight loss and damage for the year 1945 is revealed in a summary compiled by the Freight Claim Division of the Association of American Railroads. Out of 16 categories of damage causes listed in the report, only one category shows a decrease over the preceding year. The report stresses the need for greater efforts in the direction of preventive measures for better control of loss and damage factors.

EFFECTIVE May 15, the name of Coaltoter Conveyor Co. (not inc.), 310 S. Michigan Ave., Chicago, was changed to Material Movement Industries. According to Managing Partner Horton Conrad, the name was changed to more accurately portray the breadth of the company's equipment and activities in the material handling field.

Material Movement Industries manufactures electric and gasoline portable engine-driven conveyors for handling bulk and packaged materials.

FLOW Magazine wishes to announce the resignation of Mr. Curtis H. Barker, Jr., as consulting editor. Mr. Barker has decided to devote his entire efforts to his personal business interests.

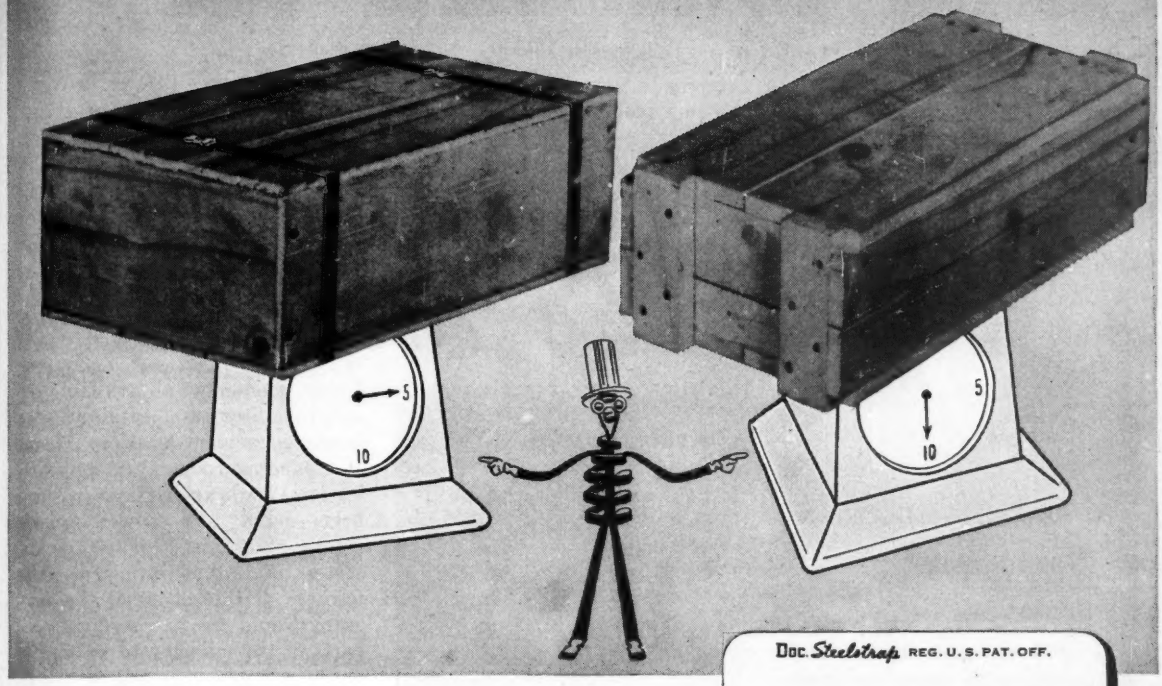
INSTEAD of a dearth in industrial building construction generally anticipated after the war, the greatest expansion in history is getting under way. Despite strikes and shortages of materials, industrial construction in progress today is greater than at any time since the rush for war plants in 1942-43. Construction engineers estimate that the work now moving at some degree of speed amounts in value to hundreds of millions of dollars. Automobiles, rubber, chemicals, plastics, rayon, steel and food plants are the highest classifications in the list.

Many industrial plants became obsolete during the war; shifts in population are another cause for new building; the rubber industry is being decentralized; automobile companies are building new factories in preference to reconverting war plants, which is considered slower and more expensive.

Practically all materials are scarce except cement, which is in fairly good supply. This fact is leading

(Turn to page 55)

"BOUND TO GET THERE"
with Less Tare Weight...



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S. K. Towson

Meet the Institute

The men and committees that are working to serve the interests of the entire material handling industry.

WITH the cessation of hostilities, the activities of The Material Handling Institute, Washington, D. C., have been resumed with a forward-looking program that was initiated at a meeting in Cleveland. With the end of war work and the removal of ODT regulations, the organization is again free to devote itself to promote the long-range interests of the industry.

At the recent Cleveland meeting, the first postwar steps were taken for the preparation and execution of a constructive program for the future. The following were among the subjects that came up for discussion.

Means of coordinating the efforts of members participating in exhibits, so that the material handling displays will be concentrated in one area, instead of scattered in various sections. The Washington office, which is available to members in connection with any capital city business. The possibility of building a material handling library in Washington headquarters, which would make available to U.S. and foreign customers all available descriptive literature, catalogs, etc., in one convenient location. Means of extending cooperation to existing local trade associations in allied fields—hand and power trucks, cranes and hoists, pallets, skids, casters, and other equipment. The purpose of this phase of the program would be to coordinate all parts of the industry to which the

Samuel W. Gibb

Walter C. Stuebing | J. G. Greene | C. H. Warner | M. W. Heinritz | H. A. Gehl

Institute might render useful service.

These and other long-range subjects were discussed, pro and con, at the Cleveland meeting. While some parts of the program are being acted on by committee members now, others must necessarily wait until a more opportune time.

As President S. K. Towson put it: "We are willing to act in the interest of the whole industry. Anybody is eligible to membership who manufactures material handling equipment. Fellowship memberships have also been provided to sales engineers and industrial engineers who are interested in the great material handling industry."

The following new officers and directors were elected at the Cleveland meeting.

Officers: President Sheldon K. Towson, The Elwell-Parker Co., Cleveland; Vice-President Samuel W. Gibb, The Yale & Towne Mfg. Co., Philadelphia; Secretary-Treasurer and Counsel C. M. Dinkins, Washington, D. C.

Board of Directors: Chairman S. K. Towson; Vice-Chairman S. W. Gibb; L. C. Backart, The Rapids-Standard Co., Inc., Grand Rapids, Mich.; H. A. Carter, The Geneva Metal Wheel Co., Geneva, Ohio; M. W. Heinritz, Philco Corporation, Storage Battery Division, Trenton, N. J.; Lester M. Sears, Towmotor Corporation, Cleveland; Walter C. Stuebing, Lift Trucks, Inc., Cincinnati.

Shortly after the Cleveland meeting, President Towson appointed the following committees.

Committee to investigate plans for an annual material handling show: Chairman E. J. Heimer, Barret-Cravens Co., Chicago; Ezra W. Clark, Clark Equipment Co., Clark Tructractor Division, Battle Creek, Mich.; Gordon J. Berry, The Electric Products Co., Cleveland.

Membership Committee: Walter C. Stuebing; M. W. Heinritz; F. J. Shepard, Jr., Lewis-Shepard Co., Watertown, Mass.; C. E. Smith, Towmotor Corp.; J. F. Thomas, Thomas Truck and Caster Co., Keokuk, Iowa.

Committee to develop with the U. S. Department of Commerce the possibility of establishing a material handling division to collect and disseminate information: C. H. Warner, Washington representative, Clark Equipment Co.; Joseph Green, Philco Corp.; Howard E. Scofield, The Yale & Towne Mfg. Co.

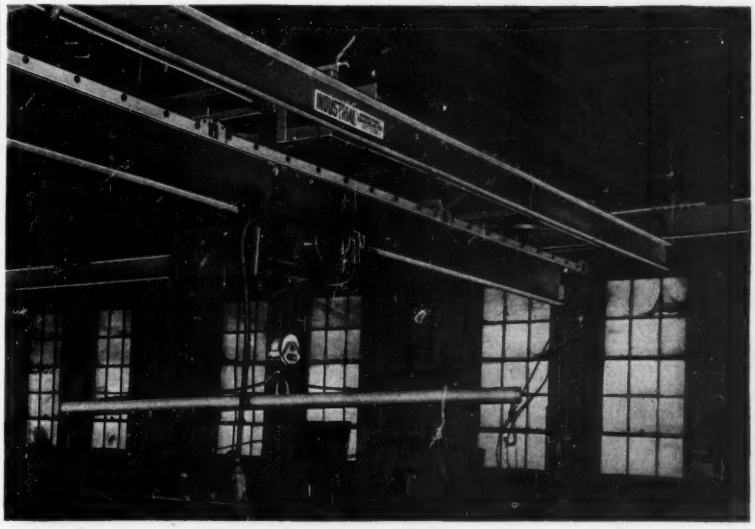
A meeting of the new Board of Directors was held at the Hotel Cleveland, Cleveland, on June 4. The chairmen of the committees made their reports and recommendations. The directors are now proceeding with the Institute's program for the remainder of this year.

The address of the Institute's business office is 533 Shoreham Building, Washington 5, D. C.

IN YOUR AUGUST ISSUE

How millions of pounds of ground meat are handled without being touched by hand . . . Scrap reclamation of a leading railroad shows some topnotch handling . . . The flexibility of standard devices is illustrated in a warehousing operation . . . A story about a small gear plant shows how the company increased production by 25 per cent with hoist handling.

Industrial CRANES



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HOW Timken

Concluding part of the article in the June issue. Begun in 1944, this new production line provided shorter travel of work between machines, thus reducing handling tasks.

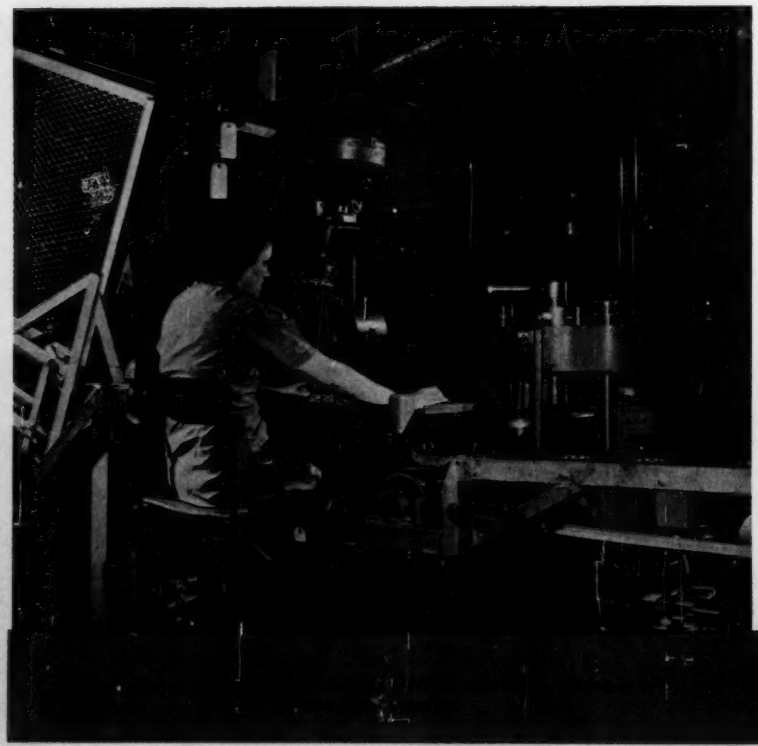
By KENNETH R. ADAIR and C. W. AUSTIN
Assistant Superintendent Engineer
Timken Roller Bearing Co., Canton, O.

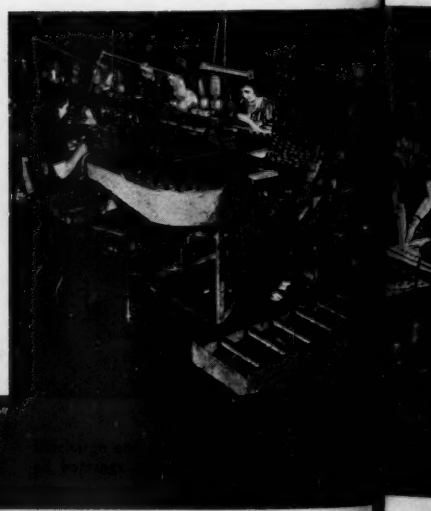
Efficient Assembly

Six assembly groups, each consisting of an assembly machine, a hydraulic cage truck hoist and a short L-shaped gravity conveyor, the end of which is adjacent the right hand of the assembly machine operator, are located near the storage area mentioned in the preceding paragraph, near one side of the roll storage mezzanine deck noted previously.

Baskets of sized and inspected cones are placed on the L-shaped gravity conveyor and moved to working position for the assembly machine operator. Rolls are placed in the assembly machine hopper by means of a Syntron operated chute and replenished from time to time.

Cages loaded in trucks are moved by means of hoists to such a position that they feed down to the left hand of the assembly machine operator. This operator assembles the three component parts—cone, cage and rolls—and places the assembled bearings into one die of a two-die dial-type closing-in press, where the cages are closed in to hold the rolls in position. This closing-in press is intermittently operated by the re-establishment of a light beam which is broken by the hand of the assembly machine operator when placing a bearing in the die. The rotation of the dial of the closing-in press discharges the closed, assembled bearings on narrow high-speed belt conveyors, which carry the bearings one at a time into sound test booths, where they are discharged into bins. The empty





KEEPS THE BEARINGS . . . Rolling . . .

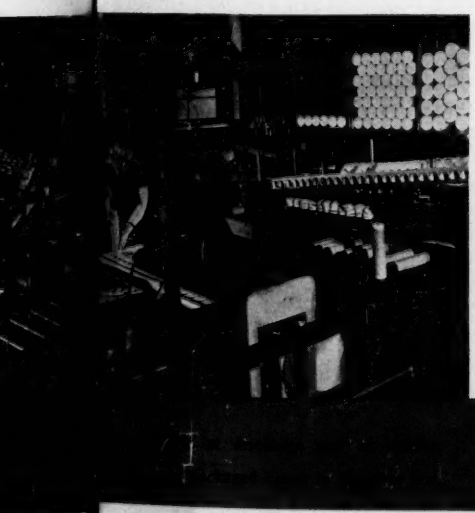
PART II.

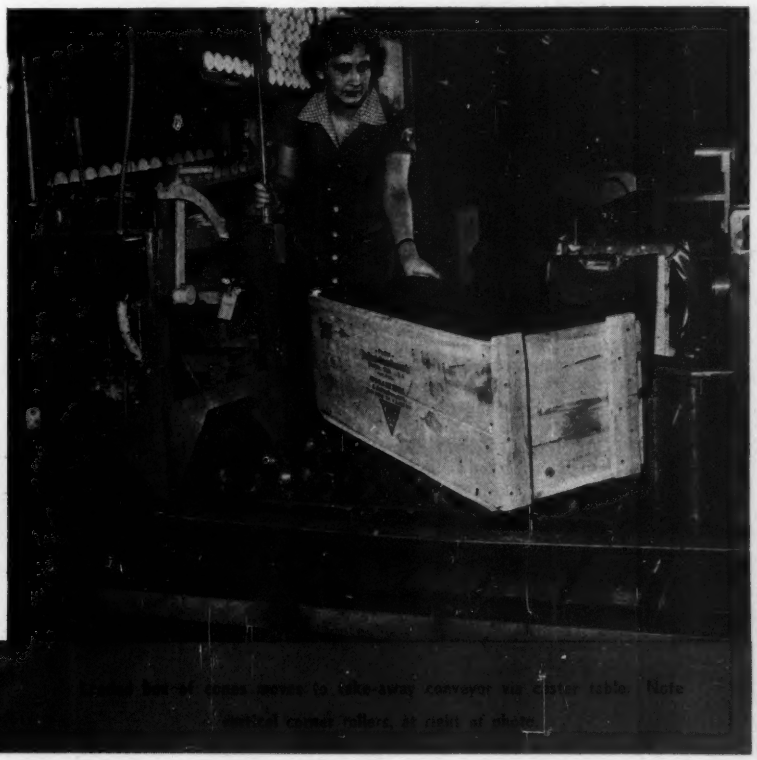
baskets at the assembly machines are placed on the belt of the cup salvage conveyor, which here moves in a trench immediately under the cage truck hoists. Access to the line is provided by means of plate doors.

After delivery to the bins and the sound test booths, the assembled closed-in bearings are placed by operators into sound test machines in sound proof rooms where, by means of the bearing rotating at high speed under heavy load, various defective bearings may be removed from the production line. At the same time the operator reads the "stand," or over-all height, of the bearing on a dial indicator located at the back of the sound test machine. Bearings that are under or over the permitted tolerance are removed. Those which have passed the sounding operation and height-gauging are placed by the sound test operator on a small high-speed belt conveyor located at the back of the sound test machine. These belt conveyors move the OK bearings to one of a series of three combination water washing and cooling machines. It should be noted that the assembly groups and the sound test booths are grouped in pairs so that one washing and cooling machine will serve two assembly groups.

Going to Final Inspection

From the washing and cooling equipment, these high-speed lines serve two complete part number lines. In other words, for purposes of space conservation the equipment next in line has been compacted into three double lines. Following the three washing and cooling machines are three final inspection benches on which the bearings from the cooling operations are discharged.





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MOTORIZED HAND TRUCK

Front View

Rear View

The MOTO-TRUC High Lift Pallet Truck

Lifts loads up to 3000 pounds to a height of 60" in 1½ minutes. Positive and sensitive control lets loads down *smoothly, safely.*

Operated by two motors, one for forward and reverse movement controlled by a twist of the handle—and the other, with push button control, drives pump for hydraulic ram. Power is furnished by a six volt 238 or 495 ampere battery.

POWER UNIT IS UP TO 11" NARROWER than that of any other make of motorized hand truck, greatly reducing overall length and turning radius.

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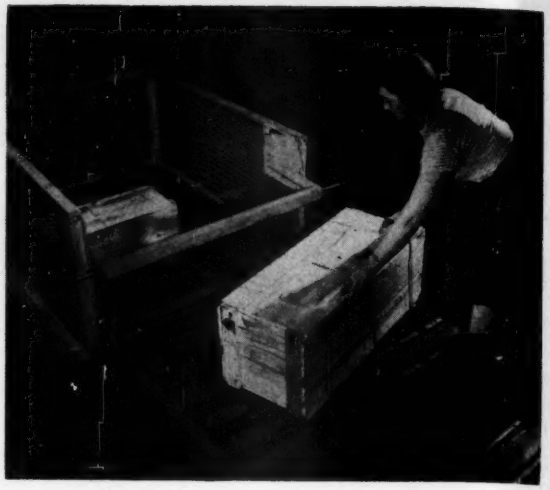

Heavy box is easily swung into position by nailing operator on shipping room conveyor line. (See photos on page 50.)

Each of these three inspection benches consists of a pair of high-speed belt conveyors, positioned to receive bearings from the cooling operations. The benches are placed on both sides of these high-speed belt lines, each bench being equipped with a bin into which work from the belt conveyor is discharged. There are three such tables and bins on each side of these final inspection tables, and an electric counting device proportions the bearings from the belt equally into each bin. Inspectors at these bins inspect the bearings, while the rejected work is first placed upon peg boards for a later re-inspection by the OK checker.

OK bearings are deposited, as finished, by the inspector on the plate of a counting device which in turn deposits the bearing on the belt of high-speed conveyors passing in front of the inspectors and delivering the approved checked work to bins at one end of these groups. Counting devices at the ends of these last mentioned belt conveyors remove from the belts amounts varying from one to 2% of all OK bearings for a final percentage check. The remaining bearings are discharged into work bins at one end of these groups.

A table plate operating on the principle of a filing cabinet drawer provides work space for plug gauges serving the two lines of each group and permits passage when moved back. The plug gauge operator works out of the bins at the ends of the inspection groups and deposits the OK bearings on to a belt conveyor which moves these bearings successively through a washing, drying and hot slushing operation. Bearings which any operator of the inspection group has rejected are rechecked and then either returned to the production line or delivered to salvage. Those bearings which have passed their final check are moved through the washing, drying, slushing machine and deposited on to small belt conveyors at their discharge ends. These belt conveyors transport the slushed bearing immediately into the chutes of machines which place them in paper tubes.

Packing, Shipping Also Facilitated

The operator of the packaging machines removes the tubed bearings from a chute, through which they are delivered by the machine. She places and seals covers on the tubes, and stamps on the tube cover the part number and other information pertinent to the bearings. The filled and finished tubes are then deposited in a wax-paper-lined wooden shipping box placed on a roller conveyor table adjacent a slat conveyor. The latter transports the filled boxes to the nailing and shipping departments.

Since the boxes are necessarily at right angles to the take-away conveyor, the handling at this point is facilitated by use of caster tables that are placed between the conveyor tables (upon which the boxes are filled) and the take-away slat conveyor.

Thus a 90-pound operator can easily place a 700-pound box on the take-away line. It should be noted that this moving operation is so simple and easy that within a very few days a new operator is able to handle heavily loaded boxes

with one hand. See the photos.

The conveyor used to move loaded boxes from the cone packaging machines is more or less Z-shaped in reverse and consists of three slat flight conveyors with roller curves. The box receiving end is about 12 inches above the floor, the intermediate section slopes to 43 inches below the floor, and the discharge section passes below the cup inspection line rising to 12 inches above the floor at the end of the electropneumatic gate partially described as being part of the cup packaging bench and conveyor. This gate permits passage of boxed cups from this conveyor to the discharge section of the boxed cone take-away conveyor when the gate is down. Electric devices operated by boxes of cones rising from below to the floor level move this gate out of the way and stop the cup packaging bench conveyor. When boxed cones pass the danger point, electric devices permit the dropping of the gate and start the cup bench conveyor.

The take-away conveyor moves boxes of cups and cones over a section serving as a platform for a scale and, after weighing, to a nailing station where the operator stands in a pit about 12 inches below floor level and nails on the box tops, applies wiring and stencils the boxes for shipment.

From the nailing station boxes may be moved by means of overhead cranes to nearby storage areas, or they may be dispatched to the shipping area for immediate shipment. In the latter instance, the nailing operator moves the completed box from a roller conveyor to a slat flight conveyor operating in a trench and so positioned as to be available either to the storage area cranes or to the nailing stations.

The loading station for the underground shipping conveyor consists of a wide roller conveyor table equipped with very short rollers upon which the girl can swing the boxes 90° and slide them sideways down a metal plate on to an underground slat conveyor.

The slat type shipping conveyor moves under the boxed storage area to the shipping room and is so placed that work is delivered at a terminal point adjacent both to the car loading dock and a number of truck loading docks. The three loading stations for this conveyor are so placed that they are available from all storage areas and from the nailing stations.

Space-Saving Tilting Device

Electric eyes signal at two loading stations when boxes are near the loading station so that operators at these points will not send one box down on top of another. This conveyor was put underground to save floor space in the storage area and for this reason the usual sloping arrangement to bring the boxes out of the trench was not used. In place of this arrangement, a motor driven tilting device was designed so that loaded boxes delivered from the underground conveyor would be brought up to floor level by the tilting device, so positioned that a stevedore truck could be placed under one end of the box and the latter easily removed from the conveyor.

If a box arrives at the discharge

(Turn to page 50)

If you, like so many others today, are cramped for warehouse space, it's time you learned about SUPERSTRONGS.

SUPERSTRONG boxes—"Bound with Steel"—come to you in flat form, so that they occupy less than one-sixth of the space normally required. The resultant saving provides that warehouse space you need so badly—and just can't find.

Let us tell you how SUPERSTRONGS can more effectively handle your future requirements.

SHIPPING TRADE MARK SUPERSTRONG CONTAINERS REG. U.S. PAT. OFF.

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Calling all trucks

Central Intercommunication Control Gives Maximum Efficiency to Plant Trucking.

By WILLIAM LEEDS

Superior of Internal Trucking
Spicer Manufacturing Corp.
Toledo, Ohio

● Control stations: dispatchers are in touch with any truck instantly through the intercom system.

● Truck operators call central control office from one of 17 substations, avoiding "empty" driving.

AFTER extensive war work which provided Spicer-manufactured parts for almost every type of combat vehicle used by the United Nations, our company has returned to the manufacture of universal joints, transmissions, clutches and other automobile parts.

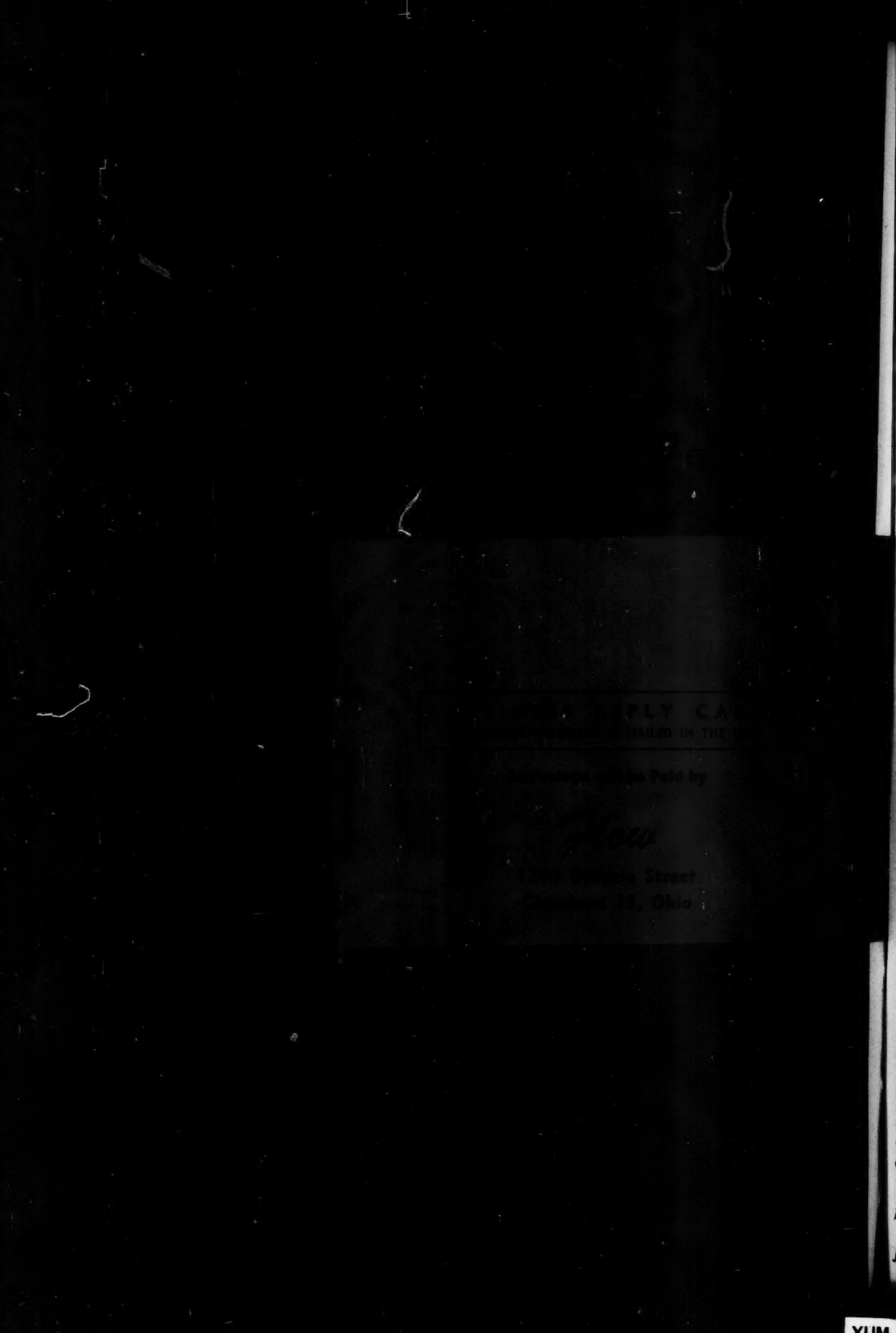
We use a great many powered trucks to convey material from one part of the plant to another, or from one department to another. The problem was how to know where any truck was at a given time so that a department which needed a truck could be served on very short notice. Much time was wasted by departments waiting for material and by departments which had material to be moved out.

Quick Communication Needed

In simple terms, the problem reduced itself to the need of quick communication between the operators of roving trucks and a central point from which the trucks could be controlled and their operations coordinated. An Internal Trucking Department was set up, and the installation of two separate central control inter-communication systems, one for each section of the plant, provided simple yet completely satisfactory solution.

The two control stations are installed on a large desk in an office designated as the truck dispatcher's office. Seventeen substations are located at strategic points which give complete coverage of the large plant. Nine substations in one section of the plant are connected to one control station and eight substations in the other section are connected to the other control station. Each substation is placed on a shelf and protected by a speci

XUM



housing as shown in one of the photos.

A control chart, called the dispatch board, is on the large desk in the dispatcher's office. An outline of both sections of the plant is painted on the board, and holes drilled in the board show the location of each department and the location of each of the seventeen strategically located substations. Through the use of pegs numbered to represent the trucks, the dispatchers, by placing these pegs in the holes representing different departments, know at all times where any truck may be. The dispatchers get the information regarding the location of the trucks through the inter-communication system. Each truck operator at the completion of a job calls the dispatcher through one of the strategically located substations and reports that he is ready for another assignment.

Two men are required to man the dispatch office because of the heavy truck traffic and the many calls for trucks which are received constantly.

No "Empty" Driving

At the end of the day, all of the trucks go to one point, known as the truck pool. In the morning, each operator takes his truck to the substation to which he is assigned. Suppose that Department 17 needs a truck. The operator at the dispatch board uses his master station to call the truck which is nearest to Department 17. The peg, bearing the number of this truck operator, is then placed at Department 17. As soon as the driver completes his work, he goes to the nearest intercom substation and reports to the dispatcher's office that he is ready for another assignment.

Our company believes in the old saying, "You can't make money driving an empty wagon." We have practically eliminated "empty" driving, particularly on long hauls. Much time is saved, efficiency is increased and over-all truck operation is greatly speeded up through the coordination of truck operations made possible by the intercommunication system.

(Photos in this article, courtesy Executone, Inc., New York City.)

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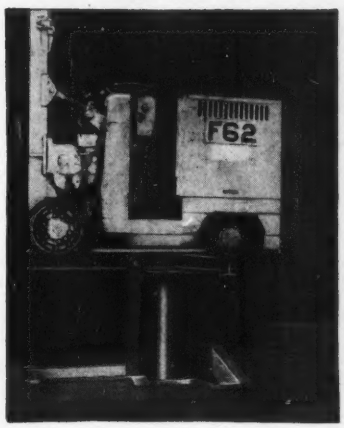
HYDRAULIC ELEVATORS

No geared hoists or cables. Elevation effected by pumping oil from storage tank to ram. Any type control available. Safe, simple, economical. Ideal for short lifts, floor to floor, basement to sidewalk, ramp eliminator, car loader, press feeder, or inspection and servicing lift for trucks, cars and machinery.

For lifts of over 25 feet we recommend REVOLVATOR Traction Elevators with three or more cables, Governor Safety and Reverse Phase Relay.

Write us your requirements and we will suggest the most efficient and economical elevator for your purpose. Revolvator Portable Elevators and Red Giant Liftrucks also available.



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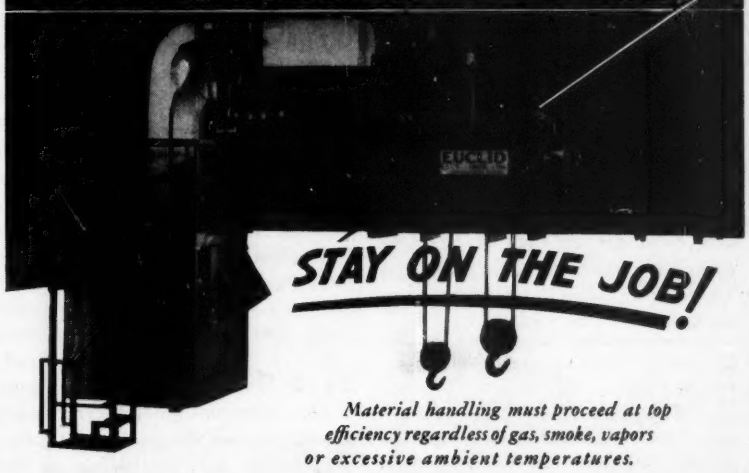
DESIGNERS AND MANUFACTURERS OF MATERIAL HANDLING EQUIPMENT
2039 86th Street NORTH BERGEN, N. J. Since 1904

take a breather - - - but



Material handling must proceed at top efficiency regardless of gas, smoke, vapors or excessive ambient temperatures.

This Euclid Crane boasts air conditioning in the cab. The operator "takes a breather", but stays on the job, working at his physical best in clear, pure air at the desired temperature.

Standard Euclid Cranes are built in 3 to 25 ton capacities with spans from 20 to 100 feet. Larger cranes of greater capacity on order.

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WRITE FOR CRANE CATALOG

HIGH SPEED GLASS LINE . . .

(Continued from page 19)

area, where they are sent via the monorail conveyor.

The glass arrives here at waist height on the long, continuous monorail conveyor. The panes are removed and packed according to size in wooden boxes, placed on gravity roller lines. The average size box weighs 800 pounds when fully packed, with approximately 100 panes to the box. As the operator packs one pane on another, a sheet of paper is placed between them to protect the glass in shipment. On the corner of the paper are stenciled successive numbers, which eliminates counting the plates.

After a box is packed, it is lifted off the gravity roller conveyor by an overhead 5-ton crane, and stored nearby until shipment. A long platform conveyor extends the full length of the storage areas and feeds the boxes alongside the box cars. They are removed from the line by the crane to the car. Within the car, the cases are positioned by means of a specially designed two-wheel wedge dolly. This handling device has an unusually long handle, which gives ample leverage. The single fork on the end is chisel type, which permits easy wedging under the boxes.

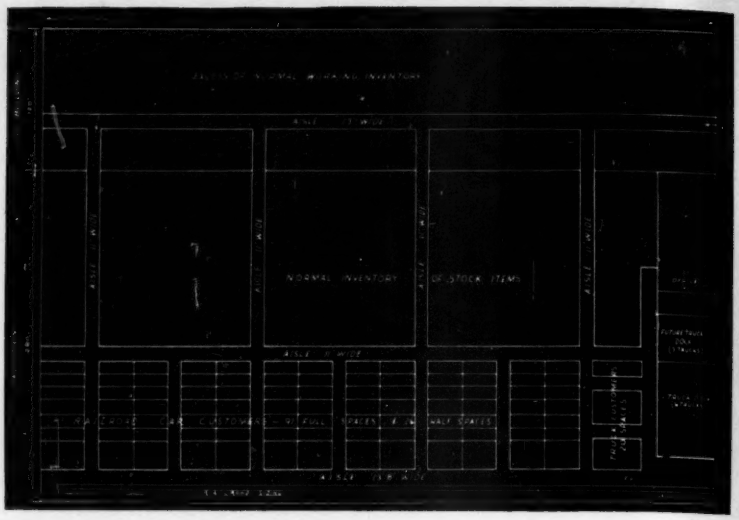
Many of the Ford vehicles—cars and trucks—are equipped with glass made in this plant at River Rouge. If you consider the huge number of units produced in a year, you get an idea of the tremendous output of glass. Efficient handling devices contribute importantly to this end.

SOLVING UNIT LOAD PROBLEMS . . .

(Continued from page 22)

plans and not on an operation already in existence. However, our plans are sufficiently developed to permit a setting forth of the main features of the project.

As can be seen from the accompanying layout drawing, our new warehouse is built adjacent to the older one. The relatively small size of the old building (120'x590') is explained by the fact that, previously, we used "customer storage spaces" in three or four separate



Plan of new warehouse designed for power handling of loads in haulage, order selection, assembly and shipping operations.

locations. That is to say, a specific area was assigned to each customer. As the material came from the production division it was moved—not to a general warehouse—but to the area assigned to a particular customer. And his order was then assembled in this area. Today, on the other hand, all finished paper produced now goes into stock in the main warehouse. This method will take less warehouse space, besides speeding the order assembly and shipping operations and eliminating manual handling.

The dimensions of the combined warehouse facility (see the plan reproduced on these pages) is 400 feet by 590 feet. Material in "excess of normal working inventory" is confined to an area in the northern part of the building. The main storage areas are blocked out in the center, though the specific stock locations for the numerous types of papers are not indicated. To the south of this center area is the space assigned to the order assembly operation. This is adjacent to the railroad siding on the southern end and to the truck platform on the southeastern part of the building.

The main aisle in the northern part is 13 feet wide as compared with the 11-foot width of the parallel main line on the other side of the center storage area for "normal inventory stock of items." The reason for the slightly greater width of the "northern" aisle is that it will be the main two-way traffic artery for incoming pallet-bearing tractor-trains bringing loads from the production division. The tractors will spot the individual trailers near the assigned stacks, and a fleet of high-lift fork trucks will then pick off the palletized units and tier them three high to a height of 12 feet six inches (to the top side of the load). We are figuring a maximum of 2,400 pounds to the load. The 11-foot width of the cross aisles will be adequate for fork truck trailer train and order selection operations. Thus all packaged goods will be palletized (on trailers) at the packing stations in the mill division. The one main exception to palletizing is skidded paper (flat stock) used by printers. The stationary head (board) strapped to the top permits tiering.

For transporting the material from production to the warehouse, the multiple trailer-trains will consist of four or five trailers each, with each trailer bearing one pallet load. One tractor will probably be used in a continuous warehouse hauling operation, including return of the empties, while a second tractor will be employed in warehouse haulage and trailer collection from the order selection and shipping areas. This tractor will also return the empty trailers for loading to the production department (at the carton packing stations). On the basis of the volume to be handled, and assuming prompt return of the empties, 65 trailers may be

used in the overall operation, including production haulage, order selection and shipping.

Fork Truck Trailer Trains

A total of six high-lift fork trucks will probably be required for tiering the incoming loads, for order selection pickup, assembly in the customers order area, shipping and various transfer operations. Since these trucks will be identical, each one short coupled to permit easy operation within the aisles, any unit of the fleet will be able to perform any of the tasks. As indicated, all trucks will be equipped with trailer towing hitches.

This will permit these powered units to operate as a fork truck trailer train operation in order selection. For example: If full pallet loads are required for an individual order, the fork truck will deposit the first load on a trailer, then pick up a second load on the forks and transport both loads to the order assembly area, towing the trailer. After depositing the loads, the truck would return to the stacks for further selections. This applies to stock items which are in sufficient demand to permit full pallet handling.

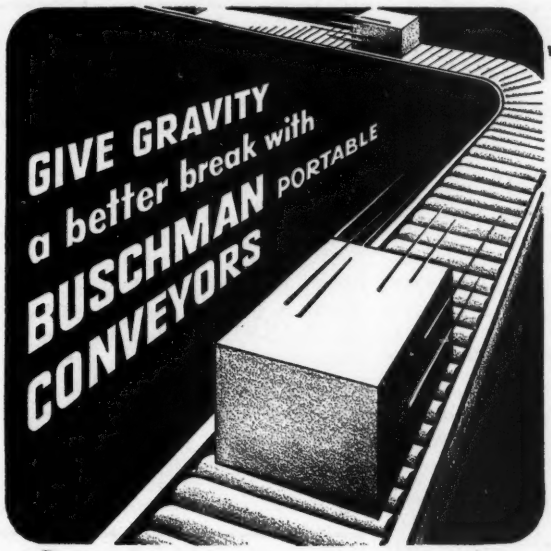
It is planned to use pallet storage racks for items to be assembled into orders of less than a pallet load. The fork truck would remove from the storage racks pallet loads in sufficient quantity to cover the needs of all broken unit-load requirements for each item. The stock clerks would then build the individual orders on pallet-bearing trailers. This would assure pallet handling for such orders even though they are composed of several smaller miscellaneous lots. In other words, both bulk storage and reclaiming as well as selective storage and reclaiming would be handled by the fork truck trailer train method.

The racks would also facilitate the handling of smaller selective orders when occasion requires. While a pallet load of one grade of merchandise is placed within the rack, a pallet load of a different grade or color would be placed on top. The rack would be high enough to permit removal of individual packages from the unit at the bottom, while at the same time keeping within handy reach stock of another desired grade, size or color in the load on top. These racks will of course be confined to an area set aside for selective stock exclusively, as distinguished from bulk stock stacked in solid tiers of the same kind of merchandise.

Keeping in Tune With the Times

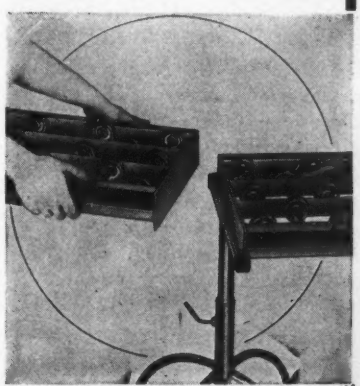
The new warehouse building is nearing completion but many details still remain to be studied and settled. In the over-all planning our engineering department makes the studies and recommendations. The Hammermill standards department cooperates by informing the material handling department on production, and thus aids in control of costs.

The material handling engineer who has been responsible for the mechanization of handling in our company for several years has been close to the new warehouse project from the very beginning. When I consulted him on the long-range



Speed Production • CUT HANDLING COSTS

Buschman Portable Conveyors are designed to do a better job than the ordinary conveyor. Both Roller and Wheel types have full ball bearings mounted in sturdy steel frames. Convenient, straight and curved sections are combined with Buschman's exclusive "Quick-Eez" couplings. Quick adjustable stands, mobile units and many other features give ease of handling to many conveyor applications. Write for full details on these smoother-running, trouble-free conveyors.



'QUICK-EEZ' COUPLING

Both ends of conveyor section are alike. No need to turn sections when setting up conveyor. Couplings are the same on both ends.

Representatives in Principal Cities

THE E. W. BUSCHMAN CO., Inc.

Winton Place Cincinnati 32, Ohio

advantages of the centralized warehousing and shipping operation, he summarized the main points as follows: 1. We should reduce overall handling costs between 35 and 50 per cent over the former method, which was decentralized and largely manual. 2. It will provide better working conditions by eliminating heavy physical effort required to store, reclaim and ship—all handling operations. 3. It will provide better space utilization. 4. And in addition to providing the requisite space for the larger volume produced by our augmented production facilities, the new warehouse will enable us to give better and faster service to our customers.

This statement sums up well the advantages that may be expected from our new warehouse facility. We feel we have at least made a long stride toward the solution of our manifold handling problems. Through the cooperative effort of the various departments concerned —engineering, purchasing, standards, material handling—we are carrying out further refinements and meeting new situations as they arise. At the same time we try to remain alert to problems that may be just beyond the hroizon. Awareness to future needs, we believe, prevents a complacent attitude toward the present—and is a means of keeping material handling operations in tune with changing conditions. And they do keep changing!

TOOLS FOR INCENTIVES . . . *(Continued from page 30)*

the operators pushing these trucks. The bolts are handled in the drums as long as these containers serve the needs of convenient positioning and handling at the various production machines. When the bolts are ready to leave the last of the fabricating stations, and movement in larger containers is indicated, they are then discharged into large skid bins.

Ready for the Next Operation

From the various forging, shearing and press departments, the pieces keep moving northward to the pickling and subsequent galvanizing operations. Practically all of the material produced is galvanized. As previously indicated, at every production step thought is given to providing the most suitable container in order to avoid rehandling at the next operation.

Here's an example. When the bolts come off the roll threader, pickling is the next operation in line. Hence the shaped and headed bolts are deposited by the threader operator directly into a wooden pickling box, shown in the photos. These containers are mounted on flat steel skids. A platform truck delivers the loaded boxes to the pickling room. Note that this type of box is equipped with steel hangers, made of one-inch stock, for crane handling.

A 5-ton crane and a 10-ton crane serve the sizable pickling tanks. The larger one has two hoists, which facilitates the handling of long stock and permits the pickling fluid to be readily drained from the material. Most of the smaller items are dipped in the type of box previously mentioned, though metal baskets, drums, and special frames are also used, depending on the product.

The comparatively long anchor rods are placed in U-shaped frames for pickling. Two separate frames, constructed of one-inch stock, make up the carriers for these loads. Each U-shaped piece has hooks at the ends for crane handling. A stand of ¾-inch stock is used for holding each of the two U-shaped frames in place when the layers of rods are started. The completed loads are handled by means of chain slings. These frames are about 52 inches high; their inside width is 38 inches. This type of carrier is readily adaptable to many sizes of oblong pieces.

The layout of the pickling room, which adjoins the galvanizing department, is so arranged that material from the shop enters on the south end and leaves on the north end.

The smaller pieces of pickled material are deposited on three-sided rail cars (see photos). By use of a hook attached to the underside of the pickling box, the treated contents are readily dumped by crane on the flat bed of the car. Very small pieces are of course handled in baskets.

MOBILE STENCILING MACHINE

Congestion in the notions shipping room of Rice-Stix Dry Goods Co., St. Louis, Mo., has been eliminated by use of three portable stencil machines in the shipping room.

Formerly notions going out to many retailers were packaged, placed on a counter ready for final invoicing, and a list of the addresses given to a girl at a single stencil machine at the side of the shipping department. Mistakes were made, and it required far too long to make out the stencils for each package.

Mike Russell, shipping room manager, developed the idea of placing three mobile stenciling machines on hand trucks and running them right up to the job to be done.

The machines are mounted on simple trucks constructed of heavy boxes on casters. Merchandise for shipping is now laid out in separate groups along a counter leading into the packing room, with a ticket on each, which gives the correct name and address of the customer. Instead of waiting until the merchandise is packaged to make out the stencil, one of the three girls rolls her machine up to the counter, picks up the bill of lading ticket and cuts the stencil "on the spot". The cut stencil board is then placed with the ticket lying on top of the merchandise, and will move into the packing room with the shipment.

When the merchandise is packed, the sealed container is stenciled with a stencil brush. In this way, no shipment is delayed while a stencil is made, and mistakes are avoided.—*Courtesy, Marsh Stencil Machine Co.*

Hoists Avoid Floor Congestion

The rail cars move the pieces to the zinc pots in the adjoining galvanizing room. One track connects the two departments at the east end, and another track at the west end. The medium sized pieces are shovelled from the rail cars into the proper dipping containers, which are handled by hoists.

Baskets containing the smaller pieces are removed by air hoist from the zinc bath. If they are then set into the spinner (this depends on the size of the pieces), the material is dumped by hoist into the water rinse. From here a conveyor discharges the material into skid bins for movement to the assembly and packing stations.

The rods, which are also removed via rail car from the pickling room, are individually wired for the zinc bath to the type of forged V-frame shown in one of the photos. By use of tandem hooks the 3-ton hoists in this part of the room handle two frames at a time, both in dipping and in removing the loads from the pots. After the rinse, the finished rods are deposited on trailers, ready for movement to the assembly department by industrial tractor.

Four 3-ton pendant-controlled hoists are used in this part of the sizable department, two hoists on each of two overhead traveling beams. The two hoists nearest the pickling room handle the loads into the pots, while the two on the other side handle the rods in the removal and rinsing operations. These two traveling beams can be lined up with the monorail track of a 5-ton crane serving the adjoining bay in this department, where a shipping door is located for dispatching material that is galvanized for outside accounts. In this way the numerous loads can be conveniently handled from bay to bay without increasing floor traffic.

NOTE: If press parts are produced in excess of the amount that can be currently used—not an unusual occurrence in our plant—the skid-bin loads of this material are moved by powered trucks to storage sheds set aside for this purpose. Here the bins are double decked to conserve floor area. For tiering purposes, two pieces of angle iron are placed across the lower skid (one length at each end), on which the upper skid is then placed. To each end of these pieces of angle iron is welded at right angles a 6-inch long piece of round stock. This prevents the skid on top from sliding off if they should be bumped.

Assembling, Packing, Shipping

As indicated, the rods are moved in tractor-trains to the final assembly and packing stations, while the smaller pieces are usually transported in skid bins. (If, after galvanizing, further press assembly operations are necessary, the pieces are hauled in suitable containers to the respective machines for final assembly.) In the assembly room, the loads of finished parts are deposited alongside a sectioned assembly table, which is shown on these pages.

The pieces making up an assembly are brought to the assemblers in shop boxes by an operator from the nearby loads, and are deposited in the bin before each girl. As she completes each piece she places it in a tote box placed at her side. Men operators on the other side of the table remove the assembled pieces and pack them into the type of wooden boxes shown. The packing, as can be seen, is done on the skids, which avoids the necessity of lifting any full boxes on the part of the operators. When a box has been packed, he picks up another *empty* box and places it on the skid. As each skid load is completed it is removed by powered platform truck to the nearby warehouse or shipping platform. Whenever possible, the skidded loads are run directly into outbound freight cars or trailers for loading.

This is a summary of the main handling tools and methods which are easing and speeding the work of Joslyn operators—the tools that help realize the potentialities of the company's sharing plan.

NEXT MONTH

How a soft drink bottling plant speeded unloading-loading operations of cases . . . a brick manufacturer adopted cube handling of concrete blocks—some of the many features scheduled for FLOW in August.

Production Totals at a glance!

PRODUCTIMETERS

give you exact production count on machines for volume manufacture. They're accurate, rugged . . . available in many types, sizes, and speeds. Electric model above, operated by contactors or photo-electrically, is ideal for remote control installations. Get full details now!

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To put "George" to work, simply slip traction-hook into box handle, pull back and your heaviest laden tote box glides over the beveled frame edge up onto the rollers with the greatest of ease. Then lead it anywhere with no more effort than to keep it rolling. "George" does the *hard* work . . . You *relax* . . . safely. Ask for Bulletin F.

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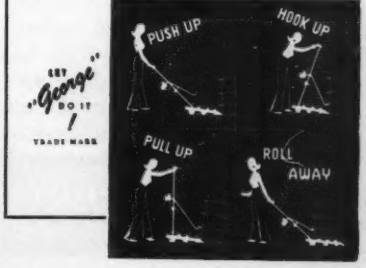


TIMKEN KEEPS THEM ROLLING

(Continued from page 43)

point on the underground conveyor and the tilting device is not in position to receive the box, electric eyes and other electrical safeguards stop the conveyor until the tilting device is again in receiving condition. The tilting device is completely automatic. When the underground slat conveyor moves the box under the device, the latter is immediately moved to the floor. Upon removal of the box, the device again resumes its original position.

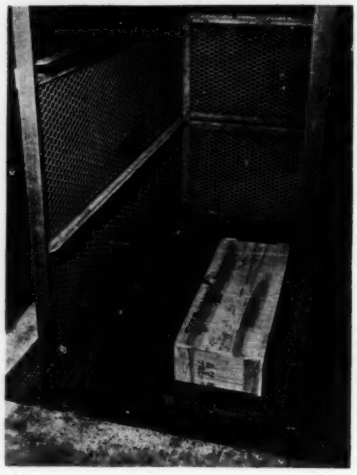
Easy, Clean Work—Balanced Flow

The layout and flow described permit operations to be broken down into simple repetitive tasks. These tasks can be performed by unskilled help after a very short training period.

Many of the employees in these operations are female, and considerable attention was therefore given to ease of operation. The present arrangement enables these women to move heavy loads with a minimum of physical exertion. Although protective smocks are furnished by the company for all female operators, these operations are so simple and easy and clean that in many instances the girls wear ordinary street clothing; and because of that, it was necessary to pay more than ordinary attention to accessability and snags upon which clothing might be damaged. To avoid as much as possible the efficiency drop caused by fatigue, which is especially noticeable at monotonous, repetitive operations, care was used to exactly position devices from which these operators receive or place the material. Correct posture chairs, and foot rests were provided, both quickly adjustable.

Because of care in designing so that work would be delivered at the best possible working positions and heights along definite routes, and taken from the operators at those points which involve the least lifting of material, the flow of material through the conveyor system has been greatly facilitated. The floor between operations is generally unobstructed and foot traffic, even at shift changes, moves freely and quickly.

The mechanical devices set a pace, and as a rule there are no unnecessary piles of parts in storage areas. Failure of work to move at any point along the line is quickly detected and easily corrected. This visual control makes for effective



Box is shown on terminal of the shipping conveyor; the box tilting device is in "down."

supervision and is a factor in the elimination of excessive paper work. The installation of the proper number of machines and work stations for each operation gives all parts of the lines a balanced flow. The ease with which mechanical devices move and condition work in process makes possible more productive effort.

This has been reflected in pro-

Here box is shown delivered to the shipping room. Now the tilting device is in "up."

duction records from the very beginning. As a result, an impressive volume of automotive bearings is being turned out every day at The Timken Roller Bearing Company.

LIFT TRUCKS

Immediate Delivery!

Automatic, 6000# Capacity, Electric Battery, Tilting, 72" and 58" Lift. A-1 operating condition, priced right. Stock delivery.

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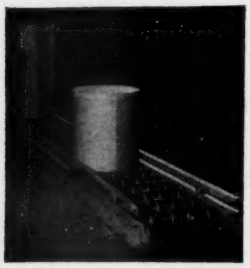
OF COMPETITION WITH LOW COST

SPEEDWAYS CONVEYORS

If material handling raises the price of your product—then call for Speedways for lower costs. Whatever your material handling problem may be, there is a Speedways model to handle it safely, efficiently, and inexpensively.



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STANDARD MODELS—12", 15" or 18" wide 5' or 10' lengths 45° or 90° reversible curves —3 sizes adjustable stands—from 12" to 78".

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Represented by experienced material handling equipment engineers in principle cities.

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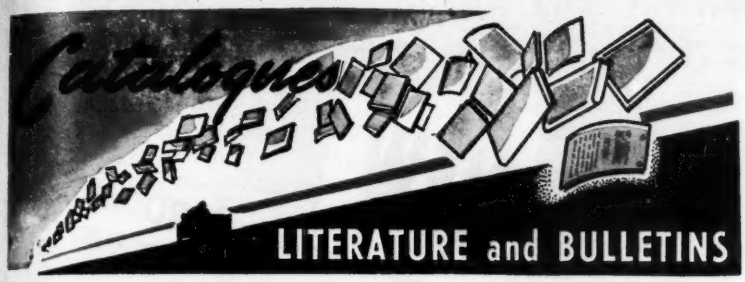


The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

186—Mobile Cranes . . . a 16-page catalogue illustrating mobile cranes designed for one-man operation, a presentation by the Orton Crane & Shovel Co. Descriptive drawings show dimensions of different models along with normal working capacities. Practical applications are featured.

187—Meat Trucks . . . a presentation by the Allbright-Nell Company on hand trucks for the meat industry. Complete specifications of each unit are given. A special section of the 32-page book is devoted to wheel and caster information.

188—Lift Truck Guides . . . three booklets by Towmotor Corporation on lift truck handling. Starting, shifting gears, lifting, stopping, and general operating information are illustrated for lift truck operators. One booklet shows accessories such as upenders, scoops, rams, etc., which may be attached to standard models. Another in this series is a "guide" featuring information on containers and safe loading and stacking practices.

189—Floor Repairing . . . two bulletins by Rock-Tred Corporation showing various methods of repairing worn or damaged floors. The description covers application of two different materials designed to renew floor surfaces.

190—Tractor Shovel . . . the Frank G. Hough Company offers a booklet on the handling of bulk materials with a tractor shovel. Sand, clay, lime, fertilizer, hides and other materials are shown being handled with this device. Loading, carrying, and dumping operations are illustrated.

191—Jacks . . . a publication on the various models and types of ratchet, screw and hydraulic jacks manufactured by the Buda Company. Capacity, height closed, rise inches, and prices are given in chart form for all types. The illustrations also show various practical applications.

192—Portable Shakeout Hoist . . . a bulletin describing a portable shakeout and flask loader by Robins Conveyors, Inc. A number of foundry handling photos are shown, and production figures are included on operations involving the use of this unit.

193—Wire Pallets . . . H. E. Fletcher Company illustrates in a four-page bulletin various uses and construction features of its steel wire 8-way entry pallet. Capacities and sizes are given together with suggested possible uses. Practical applications are illustrated.

194—Steel Belt Conveyor . . . Blackstone Mfg. Co. shows several uses for its new steel belt conveyor. Mechanical details are illustrated. Capacities and features can be furnished to suit individual plant requirements.

195—Load Movers . . . Keen Mfg. Corp. illustrates various types of steel and magnesium rubber-covered load movers in a new catalogue. These include dollies, hand trucks, carrying handles, etc. Each unit is shown in use under different handling conditions.

196—Strapping Equipment . . . a 20-page catalogue by Gerrard Steel Strapping Co. It shows strapping schedules for boxes of different weights; lengths are also listed. Suggested sizes of strapping tools for various types of packages and different types of contents are given. Numerous photos show practical applications in various plants.

197—Collapsible Bins, Steel Pallets, etc. . . . seven bulletins issued by Mechanical Handling Systems, Inc., covering collapsible racks and bins which are built up on steel pallets by use of removable side panels and ends. Portable warehouse conveyors, elevating conveyors, work carrier racks, monorail conveyors, and other types are included. Operating photos show the equipment in use in various types of plants.

198—Conveyors (Pneumatic, Roller, etc.) . . . an illustrated bulletin by Standard Conveyor Co., discussing various types of conveyors in machine shops, appliance manufacturing, shipping rooms, sheet steel and coil manufacturing. Interplant pneumatic systems are also shown.

Whether it's a . . .

✓ SKID LOAD

or a

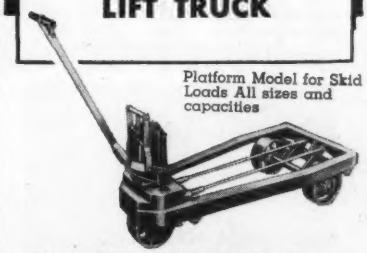
✓ PALLET LOAD

You can handle it quickly, easily and cheaply with a

LYON-Raymond

Hydraulic

LIFT TRUCK



Platform Model for Skid Loads All sizes and capacities

Check These SUPERIOR Features

- Fingertip lowering control
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- Self-contained Hydraulic Pump and Ram
- 360° Turning and Operating Radius
- One-piece, all-welded, steel frame
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Ask for bulletin describing these trucks — Consult us on your Material Handling Problems.

Pallet Model 4000 lb. capacity—for single or two-faced pallets

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Men wanted *Jobs wanted* *Lines available*

RATES: minimum, 25 words, $2.00; each additional word, 10c. Bold type or all capitals: minimum, 25 words, $3.00, additional words, 15c. All insertions are payable in advance.

JOBS WANTED

Graduate Chemical Engineer (Master's 1935) ten years broad progressive engineering experience including 2½ years in materials handling, palletizing and packaging. Send reply to Box 303, Edgewood, Md.

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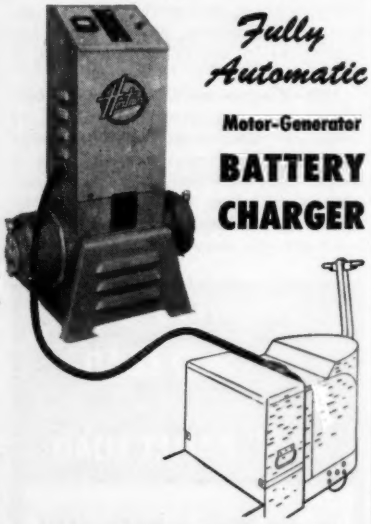
Manufacturers' Representative
New York City Area
Seeks Sales Agency for a
Fork Lift Truck
Gas Driven
Have Large Sales Organization, Warehousing Facilities and Maintenance Department. Box 7146, FLOW.

For **PEAK PERFORMANCE** *from your Motorized* **LIFT-TRUCKS** *Every Day*

use the HERTNER Type "H"



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FULLY CHARGES LEAD-ACID BATTERIES in 8 hours

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Automatic Charging Rate

Amount of charge is governed by completely automatic controls—over-charging is impossible, yet a fully rundown battery can be completely charged in normal charging time.

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Completely automatic controls cut off the charge and shut down the motor-generator when the battery reaches full charge.

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In the event of power failure, generator shuts off automatically and when power is restored motor-generator automatically restarts and charging is resumed.

"Automatic" Economy

Due to the inherent characteristics of motor-generator design, the Hertner Type "H" charger provides "automatic" economy.

Write for Bulletin 101 describing Type "H" single-battery charger. Hertner Type "H" chargers are also available for charging 2 or more batteries at one time. Write for Bulletin 102.

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A General Precision Equipment Corporation Subsidiary

Motors • Generators • Motor-Generator Sets

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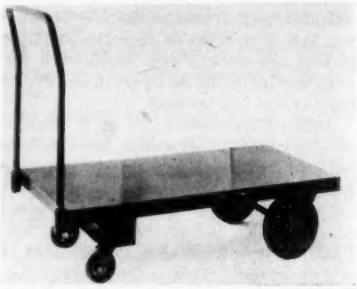
Representatives in principal cities throughout the world

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

HAND TRUCKS

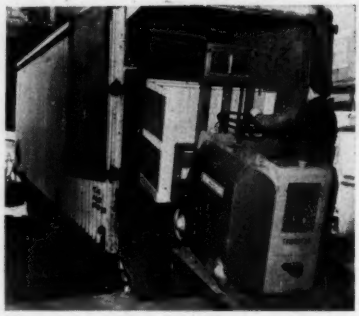
SEVERAL new ball-bearing wheeled hand trucks are being offered by Laughlin Manufacturing Co., Chicago. The wheels are rubber-tired and are renewable.



The framework is steel tubing, and rubber handles are provided. A four-wheel hand platform truck is also offered. The deck is made of 14-gauge welded-steel construction with 2-inch angle frame.

SIDE-MOUNTED LIFT TRUCK

A NEW lift truck, with a side-mounted motor engineered to cut wheelbase length to 35 inches, is announced by Towmotor Corp., Cleveland. The model LT-35

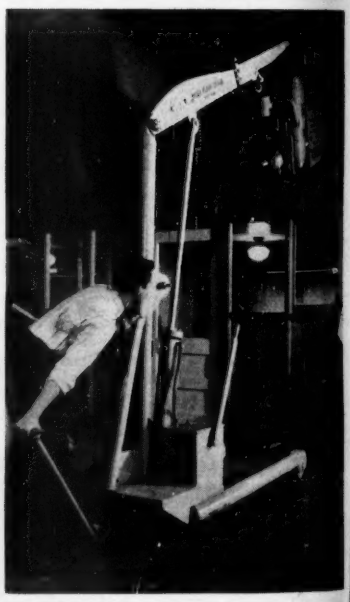


weighs 2800 pounds, and will lift, carry, and stack a load of 1500 or 2000 pounds, states the manufacturer.

The new design places the operator at the side of the power unit. The seat has a back rest and is fully protected from front and rear. Two wheels on the steering axle achieve a short turning radius. Removal of a side plate permits all electrical and carburetor adjustments. Clutch replacement can be accomplished without moving either the engine or transmission, according to the release.

HYDRAULIC FLOOR CRANE

THE Ruger Equipment Co., Portland, Ore., offers a new crane featuring a movable lifting beam powered by a hand operated

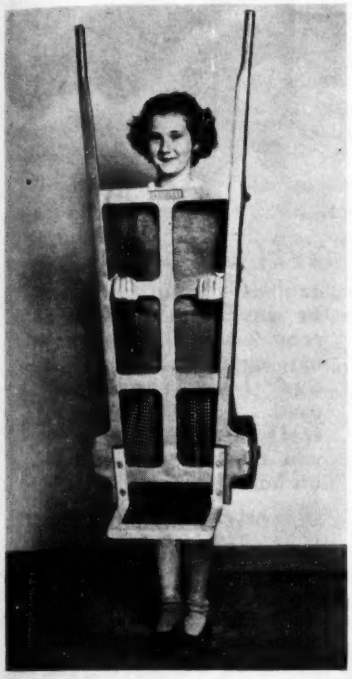


hydraulic system whose action can be up, down, in or out. It comes with ball bearing wheels, handle. Three sizes offered are of one, two, and three-ton capacity. Attachments include an extension beam

for greater height and a special accessory for removing transmissions.

MAGNESIUM HAND TRUCK

THE Zephyr hand truck, made of cast magnesium alloy by Magnelux Mfg. Co., Los Angeles,



weighs 26.6 pounds. Wheels are cast magnesium equipped with ball bearings and the rubber tread is molded-on. The nose is made of rust-proof steel, according to the company's release.

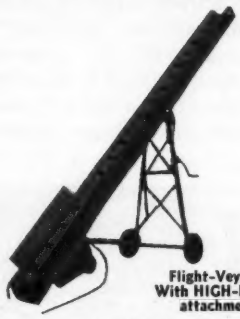
EXPENDABLE PALLET

A FOUR-WAY expendable pallet is offered by Techtmann Industries, Milwaukee, Wis. Constructed of a double corrugated board top, supported on square or round wood blocks, the new pallet

will support a 4,000-pound load, it is claimed. Tests are said to show that these pallets will withstand several trips without appreciable damage under normal conditions of shipment by truck or rail, according to the company.

Various sizes and double faced pallets are available with block spacings to suit users' lift equip-

It's An Easy Job for
FLIGHT-VEYOR



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With HIGH-BOY
attachment

An all purpose Industrial Conveyor that's a real time and money saver. Moves ashes, cinders, grain, chemicals, metal, aggregate, clay, coal, etc. Equipped with 1¾" high, chain drag-flights. Four sizes: 8 and 12 inch widths, 13 and 20 foot lengths. Raises material up to nine feet with 13 foot model and up to 14 feet with 20 foot size. Where a belt is desirable, use CON-VAY-IT.

Manufacturers of Coal-Veyor, Coal-Veyor, Jr., Con-Vay-It, Flight-Veyor.

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WHY ENGINEERED DESIGN PALLETS?

IN THE average operation, pallets are subjected to two types of stresses . . . compressive and bending. An inadequately designed pallet will crush under compression and break apart from excessive bending. An over designed pallet is too costly in original investment and wasteful of fork truck capacity.

An **ENGINEERED DESIGN** pallet guarantees a fork truck installation which will return the greatest of handling economies consistent with safe operation.

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SAVE PRODUCTION TIME
with a
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One man can handle heavy dies up to 500 pounds alone. Easily moved about. Also handy for loading and unloading trucks and miscellaneous lifting jobs. Platform 24 in. x 24 in. Lift of platform 4 ft. 6 in. Price $147.50 (foot operated floor lock optional, $10.00 extra). Heavier capacities available up to 5000 pounds.

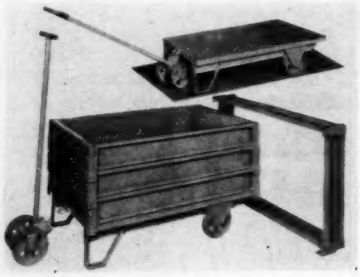
PROMPT DELIVERY
Full freight allowed.

ECONOMY ENGINEERING CO.
2677 West Van Buren Street
Chicago 12, Illinois

ment. Over 1,300 empty pallets can be stored in a 50-foot box car, using a lift truck for handling, states the manufacturer.

SEMI-SKID AND JACK

THE Market Forge Company, Everett, Mass., offers a semi-skid designed for use either with hand or power lift truck. The unit



is entirely of steel with a high tensile steel deck, completely arc-welded throughout, it is stated. The 8-inch diameter wheels are mounted on roller bearings with hardened inner races.

The skid-jack is equipped with two 8-inch diameter wheels, and it has a hook arrangement which allows the load to be lifted with more than one-inch lift provided for the front legs. The two items are available with wheels of semi-steel, plastic, cushion rubber and aluminum, according to the release.

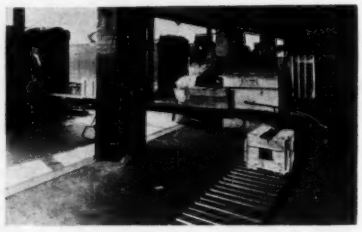
POWERED HAND TRUCK

THE MOTO-TRUC CO., Cleveland, has perfected a new motor-driven hydraulic pump, which is used to elevate the platform of its motorized hand truck. It is operated by two push buttons mounted in the ends of the roller handle control. By a finger-tip touch of a button, the hydraulic pump is said to lift the loaded platform in 10 seconds; and the load is lowered by pressing the release button.

According to a release, various attachments have also been designed. These are provided for handling ladles and flasks in foundries, lifting die blocks in and out of large presses and hammers, and for other uses. Power is furnished by a 6-volt battery, ranging in size from 238 to 495 amperes.

GRAVITY CONVEYOR

AS A new addition to its line of material handling equipment, the Rapids-Standard Co., Inc., Grand Rapids, Michigan, announces Rapid-Roller conveyor. Two standard frame lengths of 5



and 10 feet in two standard widths of 12 and 18 inches are being offered.

The rollers are two inches in diameter, projecting 3/8 of an inch above the conveyor frame level, and are mounted in ball bearings at the end. Rollers are spaced at 3-inch intervals, but sections can be obtained in spacings of 6 inches, 9 inches, 12 inches or any other multiple of the number three, states the company.

TOWSLEY

SPECIAL TRUCKS

engineered and produced to customers' individual requirements, are effecting appreciable savings over trucks commonly used. . . . Perhaps special trucks, designed by us for you, can cut your materials handling costs.

Why not put it up to Towsley?

TOWSLEY TRUCKS, INC.
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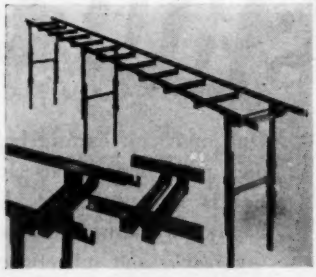
ROLLER CONVEYORS

Prompt Delivery!



* Exceptionally strong
* Unusually light-weight
* In sections or complete units
* Furnished in sizes to meet your needs

Legs rapidly adjustable.
Ideal for conveying tools, finished products, products for assembly, packaged goods, etc., throughout the factory.
Also Available:
Hand trucks, industrial shelving, storage bins and racks.

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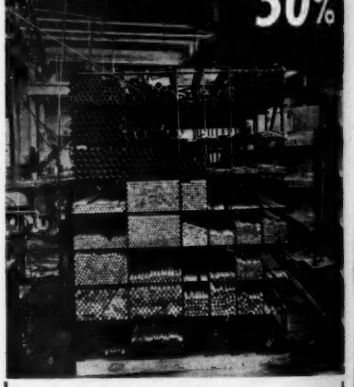
FRAnklin 7100

ECONO-RACK
INCREASES YOUR STORAGE SPACE AS MUCH AS 50%



THE RUGGED, FLEXIBLE MODERN STORAGE METHOD

For storage of bar steel, plates, palletized material, etc. ECONO-RACK has a wide range of uses. Saves space, provides easy access to stock, simplifies inventory. Inexpensive.

Descriptive bulletin ER-102 sent on request or ask for quotation based on your specific requirement.

ABELL-HOWE CO.
Engineers—Contractors—Manufacturers
53 W. JACKSON BLVD. CHICAGO 4, ILL.

ON THE PALLET . . .

(Continued from page 36)

manufacturers of pre-fabricated industrial roof tile to develop similar products for floors and walls. Each tile covers an area of 16 feet. With steel roof frames in place, an entire industrial building can be roofed in a day's time.—*The Elwell-Parker Electric Co.*

MORE than $100,000 worth of new and used steel cargo booms, ranging in capacity from four to 30 tons, have been declared surplus by the armed services and are to be sold at fixed prices substantially under their original cost.

The booms are fabricated in a steel tubular design with proper thickness and diameter proportionate to appropriate length and load capacity. Although originally designed for marine use, the booms are said to be adaptable to commercial usage in construction work as well as other fields where this type of hoist is used.

The booms range in price from $40 for a 30-foot, 5-ton to $80 for a 63-foot, 30-ton capacity unit. The equipment may be inspected upon application to the Material Disposal Section, U. S. Maritime Commission, Washington 25, D. C.—*Domestic Commerce.*

THE Chester Manufacturing Co., Lisbon, O., manufacturers of chain hoists, trolleys, etc., has incorporated as Chester Hoist Co., effective April 8, 1946. For the past five years the company operated as a partnership, and the incorporation was made in order to take care adequately of a greatly increased business volume. It is also announced that the company is going to expand its line.

The officials are: President Hal F. Wright, founder of the business; Vice President Mary T. Wright, and Secretary-Treasurer Harry E. Hill.

TODAY'S expanded buying of electric motors, generators and controls represents little or no duplicating of orders for equipment which will later be cancelled. This is the opinion of district managers and field sales engineers of The Reliance Electric & Engineer Co.

Two factors in current business trends are stated: Manufacturers want to expand quickly the production of products regularly made before the war. Plant managers increasingly realize that without replacing present equipment they cannot obtain the speeds now feasible with new materials.

Other reasons are offered for the present buying of new motor-driven machinery: Adoption of new or redesigned products by manufacturers; a trend toward automatic or semi-automatic operations, requiring more motors and control where new electric drives are being added; production managers are becoming more "adjustable speed" conscious—more aware that no one speed is the right speed for all operations of a machine. Along with cost cutting, the final consideration is "spot conversion." This refers to the use of an alternating current source and converting to direct current "on the spot" where adjustable speed is required.

THE MOTO-TRUC COMPANY, Cleveland, said to be originators of the front wheel drive motorized hand truck, has moved to larger quarters in order to meet customer demands. In addition to the pallet truck, the company is developing such other types of motorized hand trucks as high-lift, platform, and tow models for semi-live skids, according to an announcement.

Following are the officers of the company: President I. F. Schreck, Vice-President E. L. Beisel, Secretary E. H. Davidson, and Treasurer W. J. Winter.

A COMPREHENSIVE re-examination of all governmental regulations affecting industry was advocated by Lyman W. Slack, vice-president and general sales manager of the Packard Motor Car Co., at a dealer meeting in Missouri. Automobile production since V-J Day has been interrupted "by one annoying little thing after another," he declared. Packard, for example, has been forced to revise its production schedule 10 times since last October.

Packard's final assembly line, he explained, worked only nine days out of the first 90 this year, due to lack of bearings. Under present governmental regulations, spring wire is a non-profit item—and hence the steel manufacturers are naturally concentrating on other products. Other automobile companies and other industries are also beset by annoying little things, he said, which might be corrected in a realistic inventory of governmental regulations.

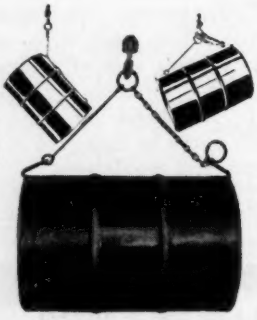
EASIER, FASTER, CHEAPER, SAFER...
DRUM, BARREL HANDLING
With a
SABIN
One-Man
TRUCK
HERE IS YOUR OPPORTUNITY TO CUT COSTS. One man with a Sabin One-Man Truck can easily do the lifting himself, that formerly called for two or three helpers. He simply runs truck up to container, hooks on at top—and an easy pull on the handle automatically loads weights up to 800 pounds. Roller bearings make travel easy.
EXCLUSIVE THIRD-WHEEL FEATURE insures dependable load support, better balance, and safety. Enables loaded truck to stand alone.
Write for Bulletin No. 45
The Sabin Machine Co.
6538 Carnegie Ave.
CLEVELAND 3, OHIO
ALSO TOTE PAN, BOX, CARBOY, KEG TRUCKS!

Universal Grab

For picking up all types of heavy boxes, crates, bales or other loads where hooks may be used.

Made of heavy forged steel hooks with an adjustable spread which provides for handling of every size load from 16" to 48". Sturdy ⅜" BBB chains. Capacity 2000 lbs.

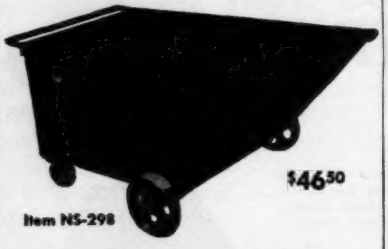
The heavier the load the tighter the grip. Let the "Universal Grab" do your heavy lifting, avoid accidents to your employees.



Drum—Barrel Sling

Half-Ton Capacity

Will handle drum for draining purposes. Can pick up drum from lying position and set on end. Use for loading on or unloading truck and for general purpose handling. Will handle barrels, drums, kegs, anything with a lip such as on steel drum or wooden barrel. Simple in construction . . . easy to operate . . . heavily welded chain, forged grab hooks. Weight 8½ lbs. Air dry enamel finish.



Hand Dump Truck

Constructed of heavy sheet steel, reinforced with band at top edge, stout ⅝" round rod iron handle welded to truck. This truck measures 25¾" by 45" at the top and 25¾" by 27" at the bottom by 17½" deep—carries about ½ cu. yd. and weighs 125 lbs. Equipped with two 8" semi-steel wheels and two 4" metal swivel casters. Air dry enamel finish.

Wood Box—Metal Bound

"Tilt-Type"

A general utility push truck, "Tilt Type" for easy wheeling and short turning of corners. Built of all hard wood, completely metal bound, all welded construction, no bolts used. Two rigid and two swivel, 5" metal casters, ½" tilt. Metal parts air dry enamel finish, wood left natural.

TWO STANDARD SIZES

Item PS-91A **$32.45**
Box measures 24" wide, 36" long, 26" high, weight 185 lbs.

Item PS-91B **$36.85**
Box measures 28" wide, 48" long, 30" high, weight 260 lbs.

Hand Truck

With Safety Knuckle Guards

Made in two sizes, both sizes supplied with metal or rubber wheels.

Truck is provided with heavy nose plate extending 7" to insure easy pick-up, and secure resting platform for load. Adapted to heavy lifting where limited space prohibits the use of larger equipment. Made with angle iron framework, heavy iron cross bars, welded on.

Furnished with 8" x 2" roller-bearing wheels. Safety knuckle guards protect the operator's hands against injury.

TWO SIZES

Item B-491-M-S **$16.00**
18" wide, 42" high—metal wheels

Item B-491-R-S
$20.00
18" wide, 42" high, —rubber tires.

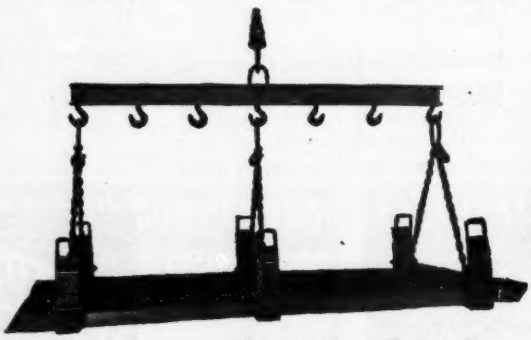
Item B-491-M-L
$19.50
20" wide, 48" high. —metal wheels.

Item B-491-R-L
$22.50
20" wide, 48" high, —rubber tires.

Weight (S models) 60 lbs.

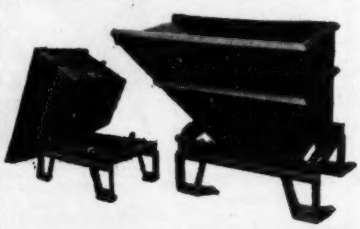
Weight (L models) 65 lbs.

All models are air dry enamel finish.



Sheet Steel Grab

For handling sheet steel in bundles of any size lift up to 9" thick, 18" to 48" wide, and any length. "Grabs" can be used single, double or triple according to size of bundle; illustration shows triple application. Capacity, one ton per "grab"—total, 3 tons. Holds sheets securely without slippage, distortion or damage to stock. Suited to high or low head room. Supporting beam measures 6' long. Heavily constructed. Weight 190 lbs.



Automatic End Dump

For Use With Lift Truck

For handling hot metal parts, scrap stampings, other heavy materials. Rockers geared to the truck. Self-seating, smooth operating. Built of heavy steel plate, reinforced with sturdy angles. All welded construction. Two standard sizes. Air dry enamel finish.

Item S-878-A **$105.00**
Capacity ½ cu. yd. Weight 600 lbs.

Item S-878-B **$115.00**
Capacity 1 cu. yd. Weight 750 lbs.

Be sure to give floor clearance of your lift truck when ordering.

We Design and build all types of Trucks, Skids, Pallets, Platforms, Racks, Boxes, Bins, Tables, for Pick-up, Loading, Moving, Shipping, Dumping and Storage.

When Ordering:

Always give "Item" number; this will help to prevent error. All weights are approximate. All prices are f.o.b. Detroit, Mich. Prices subject to change without notice.

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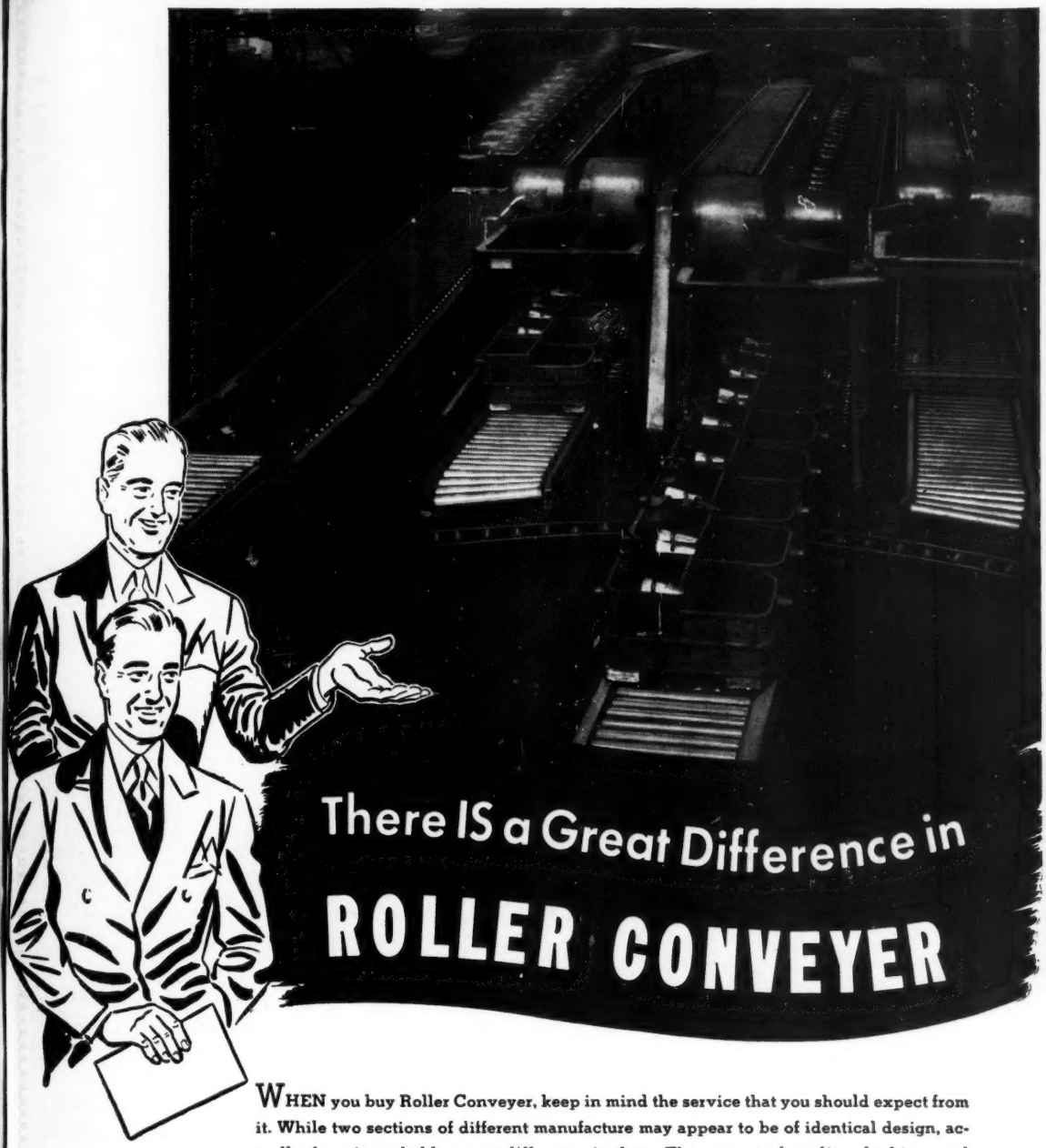
Palmer-Shile Co.

7170 W. Jefferson Ave., DETROIT 17, MICH.

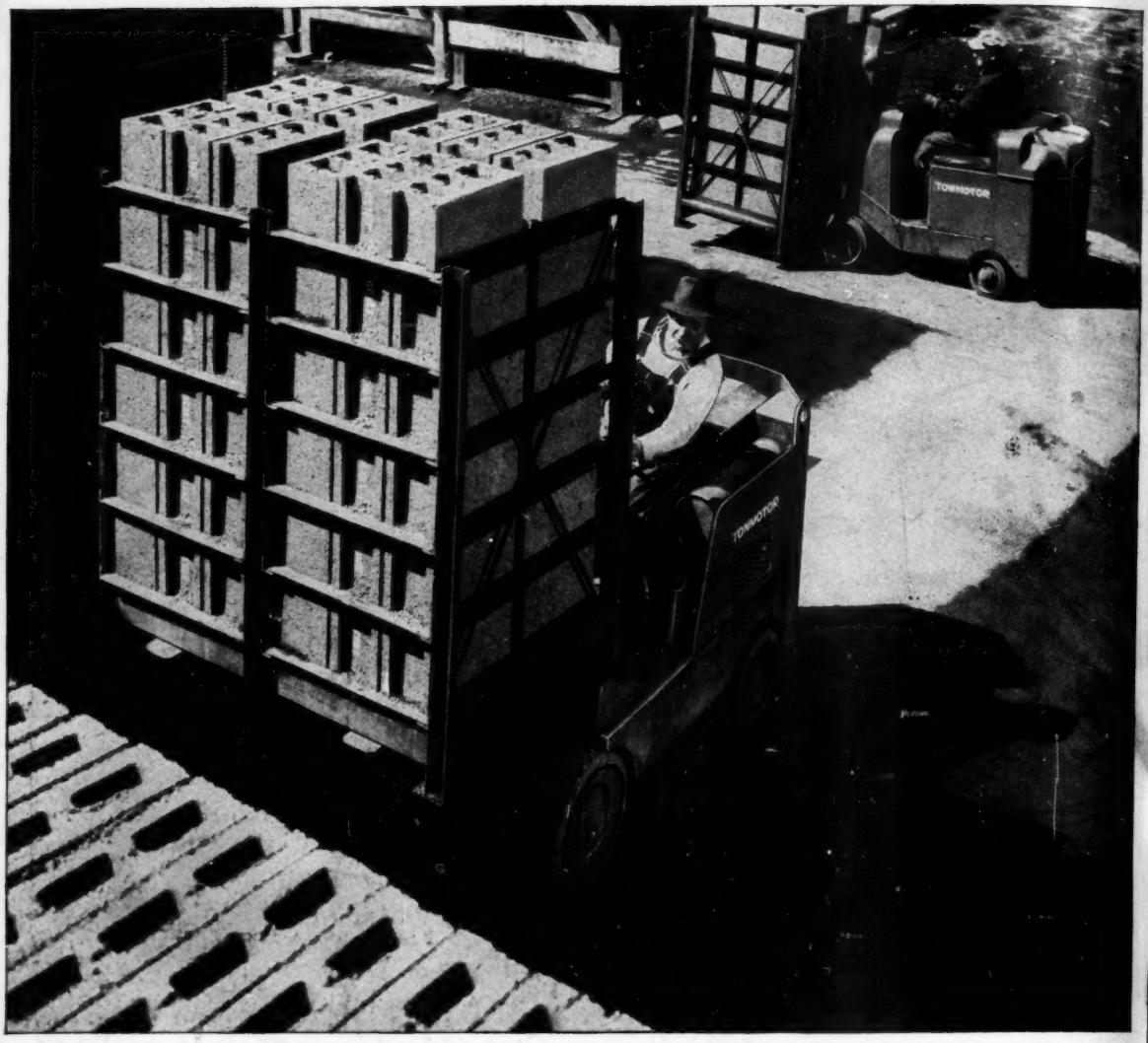


There IS a Great Difference in ROLLER CONVEYER

WHEN you buy Roller Conveyer, keep in mind the service that you should expect from it. While two sections of different manufacture may appear to be of identical design, actually there is probably a vast difference in them. The gauge and quality of tubing used — the design of the bearings and the method of their lubrication. The size and style of axles, and the method of securing them in the frames. The construction and crossbracing of the frames. The couplings and supports. The weight and strength of the section. These are points which should be considered important. They quickly show that there is a difference in Roller Conveyer.

There is 40 years' experience behind Mathews Roller Conveyer. It is engineered to give long, efficient service, and each section is designed to meet specific customer requirements. We will gladly mail you complete data without obligation.

Mathews Conveyer Company
Ellwood City, Pennsylvania



A 350 TON MERRY-GO-ROUND!

As one of the nation's largest producers of concrete building blocks, The Geist Coal and Supply Company, Cleveland, Ohio, was among the first to face the demand for increased production to meet urgent building requirements. Producing two million blocks during 1943, the company still had to turn down as many orders as it accepted. A critical shortage of full-time, experienced help and the lack of additional production machinery stymied efforts to increase production.

Seeking a solution to the problem, Geist devised a plan for operating 24 hours a day, using part-time labor and depending upon a modern Towmotor handling system to maintain an uninterrupted flow of production. Today, Geist production figures are among the three or four highest in the country, its daily output of 25,000 blocks — an increase of 400% over the 1943 figure—represents maximum machine capacity.

Towmotors on this operation transport 350 tons of blocks per day from block-making machines to curing rooms and to stockpiles and shipping. At this point, empty racks and steel loading plates are picked up by the Towmotors and returned to the machines, where the cycle begins anew.

For every handling problem there is an engineered solution . . . a solution based upon Towmotor experience and "know-how" gained in solving handling problems in every industry. Send for your copy of the Towmotor Lift Truck ANALYSIS GUIDE today. Towmotor Corporation, Div. 12, 1226 East 152nd Street, Cleveland 10, Ohio.

TAKE IT UP WITH

TOWMOTOR

THE ONE-MAN-GANG